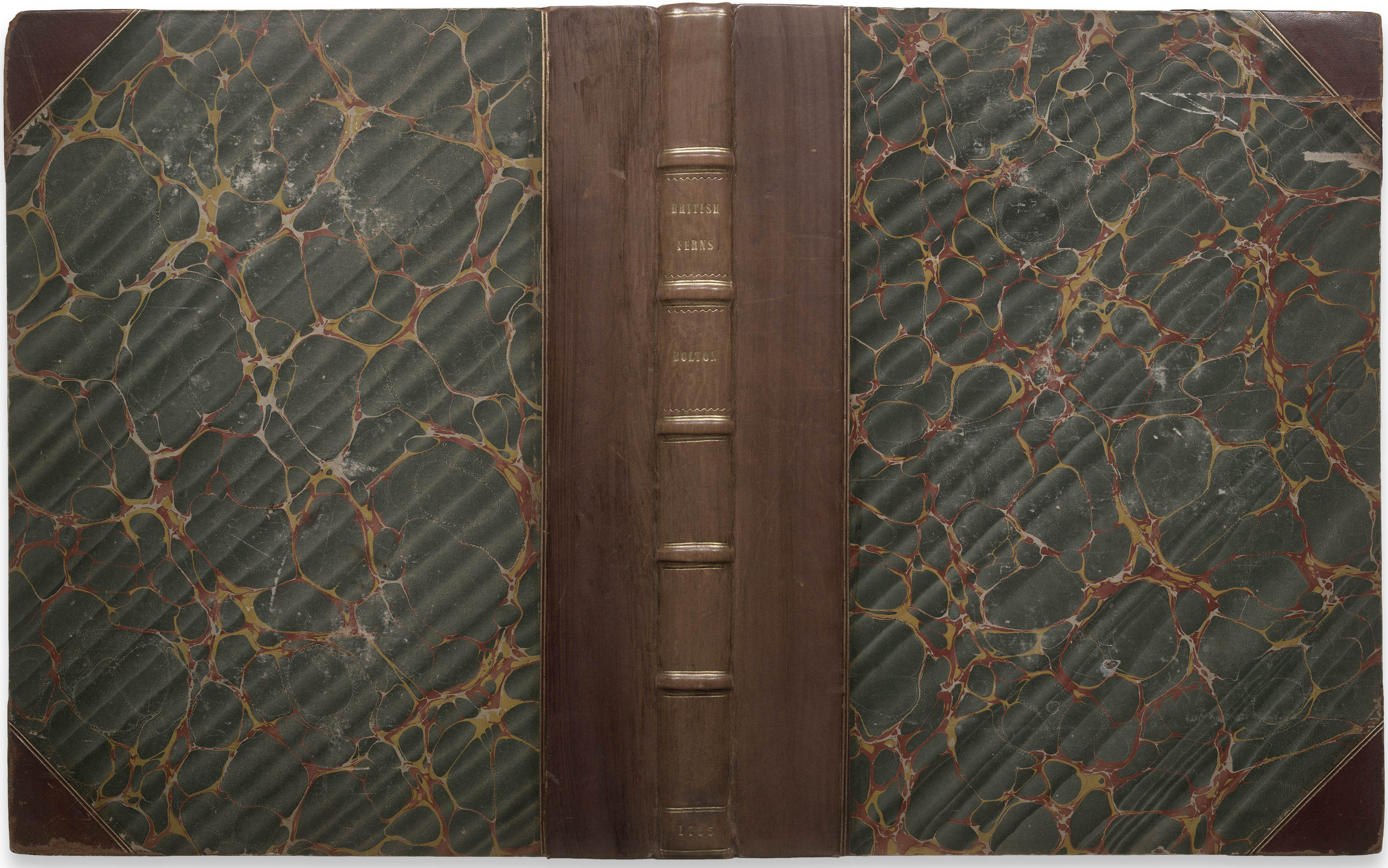

BRITISH FERNS

BOLTON

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FILICES BRITANNICÆ;

AN

HISTORY

OF THE

BRITISH PROPER FERNS.

With PLAIN and ACCURATE DESCRIPTIONS,

AND

NEW FIGURES of all the SPECIES and VARIETIES,

Taken from an immediate and careful Inſpection of the Plants in their Natural State, and engraved on Thirty-One Copper-Plates; with the particular Places noted where each Species was lately gathered, and are at this Time growing in the North of England, or on the Mountains of Wales.

By JAMES BOLTON, of HALIFAX.

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INTRODUCTION.

THE author of this little eſſay ſcarcely knows what apology to make for preſuming to appear before the publick in a ſcience which has afforded employment for the pens of ſo many learned men, and able naturaliſts.

What he has here attempted is to bring together and illuſtrate the Britiſh proper Ferns; no attempt of the kind having ever before appeared in our own, or any other language. The greateſt part of them have indeed been figured and deſcribed, but many of thoſe figures are too inaccurate to give a clear and diſtinct idea of the plant, and being ſcattered through the volumes of many authors, will ſubject to a very great expence, thoſe who are deſirous to inform themſelves of a tribe of plants ſo ſingular and beautiful as the Britiſh proper Ferns muſt be allowed to be.

It is the intention of the author in this undertaking to give a clear and diſtinct idea of every ſpecies in its various ſtages of growth, and under the various accidents it is liable to, as far as is neceſſary for enabling the ſtudent to diſcriminate each with eaſe and certainty; to exhibit them at one view, and at a ſmall expence. And if it appears that he has acquitted himſelf well in theſe particulars, he wiſhes not for a more eligible plea.

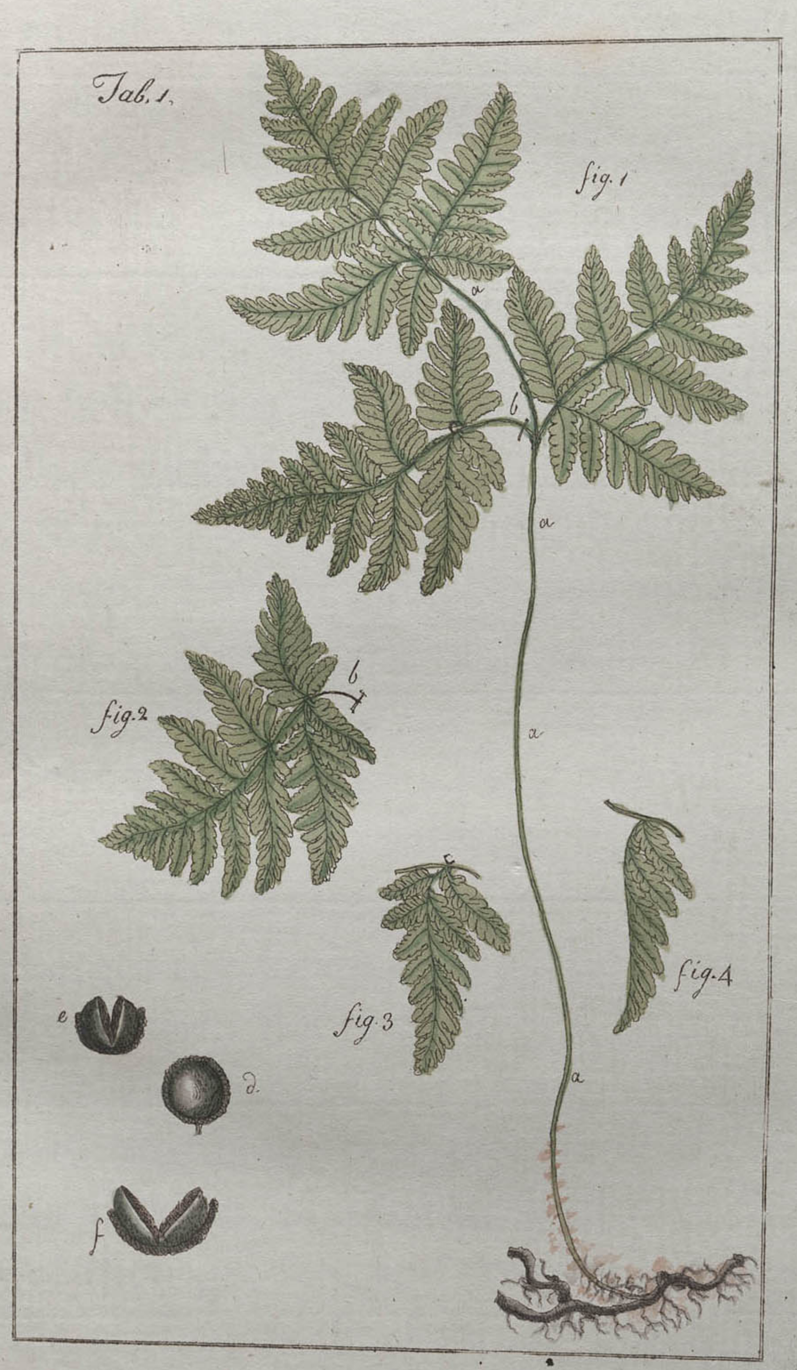
Many who wiſh to be informed of the indigenous plants of our country have neither leiſure nor inclination to purſue the ſcience of Botany in its more extenſive track, to purchaſe and peruſe the numerous volumes, and to acquire an underſtanding of the more numerous terms now neceſſary to be read and underſtood, much leſs to undergo the expence and bodily fatigue which muſt be ſuſtained before we acquire an original, perſonal knowledge of the objects in view, without which we never arrive at the ſummit of the arduous and pleaſing purſuit.

To make the little that I have written as plain as poſſible to the apprehenſion of every one, I have avoided as much as I could, the uſe of the more difficult botanic terms.

In deſcribing the ferns, inſtead of the latin terms, *frons, pinnæ, pinnulæ, &c.* I make uſe of the more familiar ones, *firſt leaves, ſecond leaves, third leaves,* and *lobes*; and, to render my meaning ſtill plainer, I have illuſtrated it with figures, *ſee Table* 1, where

Fig. 1 is a firſt leaf complete, aaaaa the rib.
Fig. 2 a ſecond leaf cut off at b.
Fig. 3 a third leaf cut off at c.
Fig. 4 the lobes.

The fructifications, which are generally placed on the back of the lobes, I have called *ſeed-veſſels*, as the moſt plain and expreſſive



Tab. 1.

expreſſive name I could think of, being more proper than that of *flowers*; as the parts which conſtitute the flowers of a fern are much too minute for the inſpection of the naked eye.

In plate 1ſt, d, e, f, I have given a borrowed figure of a ſingle globe, or ſeparate ſeed-veſſel. Theſe are placed in great numbers on the under ſide of the lobes, and every aſſemblage of them covered with a thin tranſparent film, at firſt of a pale whitiſh colour, and as it advances in growth of a browniſh hue; before the ſeeds are ripe it burſts open, and diſcovers the little globes, which are afterwards greatly encreaſed in magnitude, much extending laterally and enlarging the ſpace occupied by the aſſemblage while wrapped up in its primary cover. The globes, or ſeparate ſeed-veſſels, are of a figure truly ſpherical, and are attached to the ſurface of the leaf by a ſhort footſtalk, g. They are ſurrounded with an articulate chain, or elaſtic ring, e, d, which, when the ſeeds are ripe, breaks at h, tears open the ſhell i in a vertical direction, diſcharges the ſeeds, and, as the chain further contracts itſelf, throws open the two valves f, in an horizontal direction, by which the ſpace of the aſſemblage is again conſiderably enlarged, and hence it is that ſome of the polipodia, and many of the aſplenia, become covered with ſeed-veſſels in the laſt ſtages of their growth, and thereby become acroſticha according to the preſent mode of arrangement.

It is from the arrangement or diſpoſition of theſe ſeed-veſſels that the characters of the genera in the proper ferns are at this time eſtabliſhed.

In the genus *Ophiogloſſum*, the ſeed-veſſels are placed in two diſtinct lines, one on each ſide of the filament or tongue, giving it the appearance of a flatted ſpike.

In *Oſmunda*, ſome ſpecies produce their ſeed-veſſels in bunches of ſhort ſpikes at the termination of the fertile leaf, as in Oſmund royal, and Moonwort; in others, they are arranged in lines along the back of the lobes, as in Curled Stone Fern, and Rough Spleenwort.

In *Acroſtichum*, the ſeed-veſſels are diſperſed upon and cover the whole under ſide of the lobes.

In *Polipodium*, the ſeed-veſſels are diſpoſed in circular ſpots on the under ſide of the lobes.

In *Aſplenium* they are placed in right lines, generally running in an oblique direction on the ſupine diſk of the leaves or lobes.

In *Pteris*, the ſeed-veſſels are placed in lines along the under margins of the lobes, which are gently rolled backwards.

In *Adiantum*, the ſeed-veſſels are diſpoſed in ſhort lines, or oval ſpots, near the extremities of the lobes, which are often terminated by their filmy expanſions that are bent back and cover them.

In *Trichomanes* the ſeed-veſſel is of a globular figure, ſingle, encloſed in its own proper cover, ſolitary, ſupported on its own filament or footſtalk, which ariſes from the membranaceous verge of the rib at the origin of the ſecond leaves.

This method of arrangement, though the beſt that has yet been adopted, is in ſeveral inſtances vague and defective.

In many ſpecies of the genus Aſplenium, whoſe characteriſtic is to have the ſeed-veſſels arranged in diſtinct lines, they, when arrived at maturity, encreaſe in breadth ſo as to unite at their extremities and cover the whole under ſide of the lobes; this is frequently the caſe in Aſplenium ceterach, Aſplenium ruta-muraria, Aſplenium adiantum nigrum, &c. in the months of September and October.

In ſeveral of the Polipodia, we obſerve the ſame confluency or union in the older ſtages of the plants; ſuch for inſtance as Polipodium fragile, Polipodium thelypteris, and Polipodium fontanum.

In the genus Acroſtichum, whoſe primary character is to have the under ſide of the lobes quite covered with ſeed-veſſels, theſe ſeed-veſſels are diſpoſed in diſtinct round dots on the back of the lobes in Acroſtichum ilvenſe; in Acroſtichum ſeptentrionale they are placed, while immature, in ſhort lines. The firſt of theſe therefore, while young, is a Polipodium, the laſt an Aſplenium.

The Aſplenium ceterach, Aſplenium ruta-muraria, Aſplenium adiantum nigrum, Polipodium fragile, Polipodium thelypteris, and Polipodium fontanum, in the laſt ſtages of their growth, become Acroſticha.

In Oſmunda, whoſe character is to have the ſeed-veſſels diſpoſed in bunches of ſpikes at the extremities of the rib of the fertile leaves, we find the Oſmunda ſpicant, whoſe ſeed-veſſels are diſpoſed in lines along the under ſide of the lobes, of the fertile leaves; and the Oſmunda criſpa, in which they are placed in lines under the verges of the lobes, which are gently rolled back upon them as in the Pteris aquilina.

It muſt offend the taſte of the judicious reader to find the characteriſtics of the Genera fixed on foundations ſo unſteady, when he finds plants very diſſimilar in their appearance united; as alſo when he ſees a ſeparation take place between Oſmunda lunaria and Ophiogloſſum vulgatum, between Acroſtichum ſeptentrionale and Aſplenium ruta-muraria.

In a family of plants ſo nearly approaching in general habit, and whoſe characteriſtic notes are in nature too minute for our inſpection, there is no way of acquiring a perfect knowledge of the ſpecies, and varieties, but by making careful and repeated obſervations upon the plants themſelves, in the natural places of their growth.

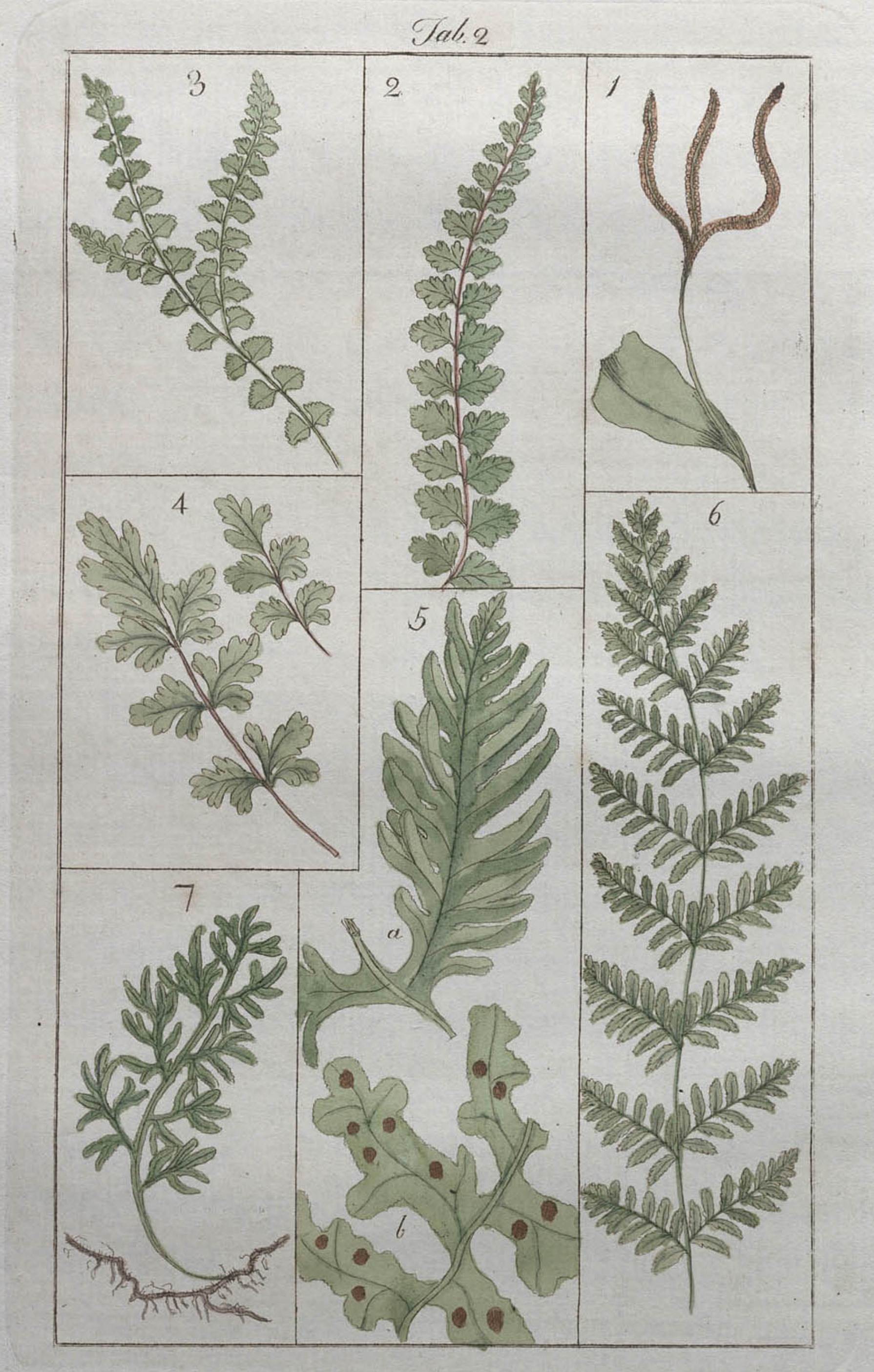
In moſt of the Britiſh proper Ferns the ſeedling plants require a ſucceſſion of ſeaſons before they produce their fructification. The firſt year that a ſeed vegetates, it produces a ſingle leaf only, which ſeldom attains to more than one inch in height, is thin, ſemi-tranſparent, and moſt commonly entire. The ſecond year two or three are produced, one larger than the other. The third year four or five are produced; and the fourth year, more in number, proportionable to the richneſs and propriety of ſoil and ſituation.

Through this progreſs of growth, the young plants appear in various ſhapes according to the various matter and place in which they grow. When the ſeeds take root in moiſt and fertile ſoils, in ſhaded ſituations, on moſſy dripping rocks, or near currents or rills of ſpring water, they produce leaves of a thin, light, ſemi-tranſparent ſubſtance. When on dry rocks, and in barren ſoils, where they are more expoſed to the air and the ſun, the leaves are few in number, ſhort, firm, and opaque. The former plants produce larger and more numerous leaves; but the latter produce ſeeds in fewer years from the firſt ſpringing up: The firſt are apt to produce leaves monſtrous in ſhape or ſize; the laſt generally retain their own proper figure.

The difference of ſize, in conſequence of ſoil and ſituation, is as remarkable in Ferns as in any other tribe of plants. We frequently ſee leaves of Polipodium filix-mas, and Polipodium filix-femina, four or five feet in length, yet I have ſeen perfect leaves in fructification not more than nine inches high in the former, and little more than ſix in the latter ſpecies. Hence, in my deſcriptions, when I ſay the leaves are from one to four feet in height, from four to twelve inches, &c. I would be underſtood to mean, that the leaves in both caſes are grown to as great a degree of perfection as the ſituation and ſoil will admit of, that the roots are of a ſufficient age, and that the plants of the ſmaller as well as larger ſize are in complete fructification.

In moiſt and rich ſoils, the Polipodium criſtatum has an upright rib, and attains the height of three or four feet; the firſt pair of ſecond leaves are ſhorter than thoſe next above them; the leaf, for the moſt part of its length is triply pinnated, or, in our own way of deſcribing, divided into ſecond leaves, third leaves, and lobes. Upon dry rocks and banks, the plant is ten or twelve inches high, the rib curves backwards from the inſertion of the firſt pair of the ſecond leaves, which are by much the largeſt, and only this firſt or loweſt pair are triply divided.

For want of paying proper attention to theſe accidental circumſtances, many imaginary ſpecies have been admitted in the liſts of Britiſh ferns. A deſire to multiply the ſpecies of plants ſeems to have prevailed amongſt the Botaniſts of the laſt age. The works of Tournefort, Vaillant, Micheli, Plukenet,



net, and others, abound with imaginary ſpecies; moſt of which, however, by the more accurate obſervations of the Botaniſts of the preſent age, are again reduced to their originals.

For the ſatisfaction of thoſe who deſire further information, I have figured ſeveral varieties in *Tab.* 2.

In Ophiogloſſum vulgatum there is a variety which produces ſeveral ſeed-ſpikes as in *Tab.* 2. *Fig.* 1.

In Aſplenium trichomanes there is a variety, having the leaves divided into ſeveral lobes, which are crenated on the extremities in an elegant and beautiful manner, *Tab.* 2. *Fig.* 2.

In very moiſt and rich ſituations, the leaves of Aſplenium viride ſometimes become proliferous, throwing out other leaves from their ſides, *Tab.* 2. *Fig.* 3. In this ſtate it has been conſidered as a ſpecies, *ſee Sp. Pl.* 1541, where it is called Aſplenium trichomanes-ramoſum.

There is a variety of Aſplenium marinum, wherein the lobes are divided and ſubdivided, as in *Tab.* 2. *Fig.* 4. This has been named Adiantum trapeziforme.

The Polipodium cambricum, *Tab.* 2. *Fig.* 5. a, is now known to be a variety of Polipodium vulgare. There is alſo another variety of the ſame plant lately diſcovered by my eſteemed friend Mr. Alexander, of Halifax, in a wood near Bingley, *Tab.* 2. *Fig.* 5. b.

There is a tall ſlender variety of Polipodium fragile, which has been taken notice of, and termed Polipodium rheticum; *ſee Tab.* 2. *Fig.* 6.

There is a variety of Trichomanes tunbrigenſe, which grows in little caverns under moiſt rocks where the ſun is excluded, and where the water, dripping from the points of the leaves, enlarges them greatly; in this ſtate the plant has been taken notice of, and called Trichomanes pyxidiferum; *ſee Tab.* 2. *Fig.* 7.

The varieties of Aſplenium ſcolopendrium are many, and very well known.

Aſplenium adiantum nigrum, Polipodium aculeatum, and ſome others are likewiſe ſubject to varieties, ſome of which I have figured on their reſpective plates.

Some of the Britiſh Ferns have formerly been in great eſteem on account of their ſuppoſed vulnerary and pectoral qualities, but like many other valuable home medicines, they are diſregarded in the preſent practice.

The uſe of Fern aſhes in the making of glaſs, boiling of ſoap, dying, &c. is very well known, and needs not here be inſiſted on.

Fern, by reaſon of its abounding in ſalts, is certainly an excellent manure for land, if cut down while green, mixed with a third part of cows dung, and laid in large heaps to rot.

Fern, being cut down, dried, and uſed as litter in the planting of potatoes, has ſometimes been known to produce an extraordinary crop; whether it would always have the ſame effect deſerves a fair trial.

Many of the Ferns might with great propriety be introduced into our botanic gardens; not merely with a view to increaſe the number of plants in theſe gardens, but alſo on account of the agreeable contraſt they produce when interſperſed amongſt plants of all the other claſſes, of their own beautiful ſingularity, and of the great eaſe with which they are procured and preſerved.

In the hot-houſe or ſtove they become evergreens, and their beauty is greatly improved in reſpect to colour and delicacy. When planted in pots, and placed amongſt other plants, their ſoft, feathery, ſilken clumps produce an effect which muſt be pleaſing to every one.

The ſpecies moſt proper for introducing as rare plants into the hot-houſe are, Oſmunda criſpa, Acroſtichum ſeptentrionale, and Acroſtichum ilvenſe, Aſplenium viride, Aſplenium marinum, and Aſplenium lanceolatum, a variety of the laſt; Polipodium lonchitis, Polipodium fontanum, Polipodium fragrans, Polipodium rheticum, Polipodium dryopteris, Polipodium phegopteris, Polipodium thelypteris, and Polipodium fragile; Adiantum capillus veneris; and Trichomanes tunbrigenſe.

Of Ferns leſs rare, of a proper ſize to be introduced for the ſake of number and variety, Ophiogloſſum vulgatum, Oſmunda lunaria, Oſmunda ſpicant, and Aſplenium ceterach, Aſplenium trichomanes, Aſplenium ruta-muraria, Aſplenium adiantum nigrum, and Polipodium vulgare with its varieties.

Thoſe which are proper for planting on dry rocks, whether natural or artificial, are Aſplenium adiantum nigrum, Aſplenium marinum, and Aſplenium ruta-muraria; Polipodium fragile, and Acroſtichum ſeptentrionale: theſe naturally grow on dry and barren rocks. And can any thing be more beautiful than the firm texture, the deep gloſſy green, the elegant diviſions and ſub-diviſions of the firſt, ſecond, third, and fifth of theſe, when contraſted with the ſoft, ſilken, feathery appearance of the fourth?

On moiſt overſhadowed and dripping rocks we find Acroſtichum ilvenſe, Aſplenium trichomanes, Aſplenium viride, Polipodium lonchitis, Polipodium fontanum, Polipodium aculeatum, Adiantum capillus-veneris, and Trichomanes tunbrigenſe.

In dark moiſt and ſhady places, under trees to enrich the ground, Polipodium phegopteris, Polipodium dryopteris, and Aſplenium ſcolopendrium with its varieties.

In lines, or little clumps along the margins of graſs plats, walks, or borders, may be planted Ophiogloſſum vulgatum, and Oſmunda lunaria.

The roots of the larger kinds of Ferns are firm, well fixed in the ground, and very durable; they continue in the places where they have once been planted, and do not ſend out ſuckers or runners to diſturb the neighbouring plants, or to occupy more ſpace of ground than is allotted them; hence they are very proper for planting round the verges of artificial bogs or fiſh-ponds, their roots forming a laſting barrier between the wet and the dry. The ſpecies moſt proper for this purpoſe are Oſmunda regalis, Polipodium filix-mas, Polipodium filix-femina, Polipodium thelypteris, and Polipodium criſtatum.

The ſeeds of Ferns, though very numerous, are extremely ſmall, and never, or very rarely, take root in cultivated ground: they will not therefore render the garden leſs fertile, or incommode the gardener by encreaſing the number of weeds.

The leaves of the larger Ferns, if cut down at the time of their full growth, and properly dried, make a thatch much more durable than that of any kind of ſtraw; and, by their lightneſs and natural warmth, may be uſed as the beſt litter for ſecuring tender ſeedlings from the effects of froſt.

The drawing and etching of the figures are performed wholely by my own hands, from a cloſe and careful inſpection of the plants. The employing an engraver would have been attended with a conſiderable and certain expence; and as the reimburſement was very uncertain, I choſe to undertake it myſelf, though I had never before practiſed the art of etching,

etching, that I might hazard only the loſs of ſo much of my own time. The truth of drawing in all the figures may be relied on, and the deſcriptions are faithful. For the execution of the plates in the engraving part, and for the ſtile in writing, I can make no other apology than that of throwing myſelf on the humanity of my friends and the publick.

HALIFAX, *Auguſt* 16*th*, 1785.

The books I have referred to are few, and ſuch only as may be ſuppoſed to be in the poſſeſſion of every Engliſh Botaniſt, namely,

Lin. Sp. Pl.	Caroli Linnæi Species Plantarum, 2 tom. 8vo. Holm. 1762.
Flo. Scot.	Flora Scotica by the Rev. Mr Lightfoot, 2 v. 8vo. London, 1777.
Flo. Ang.	Gul. Hudſoni, Flora Angelica, 2 tom. 8vo. London, 1778.
Ger. Em.	Gerard's Herbal, enlarged by Johnſon, Folio, London 1633.
Park.	Parkinſon's Herbal, or Theatre of Plants, Folio, London, 1640.

The other Britiſh Ferns, viz. the Equiſetum, Pilularia and Iſoetes, with new figures and deſcriptions, may ſhortly appear to complete the hiſtory of Britiſh Ferns, if the preſent part be well received.

FILICES BRITANNICÆ.

OPHIOGLOSSUM vulgatum.

Lin. Gen. Plan. 1171. *Spec. Plan.* 1518. *Ray Syn.* 128. *Flo. Scot.* 651. *Flo. Ang.* 449. *Ger. Em.* 404. *Park.* 506.

TAB. III.

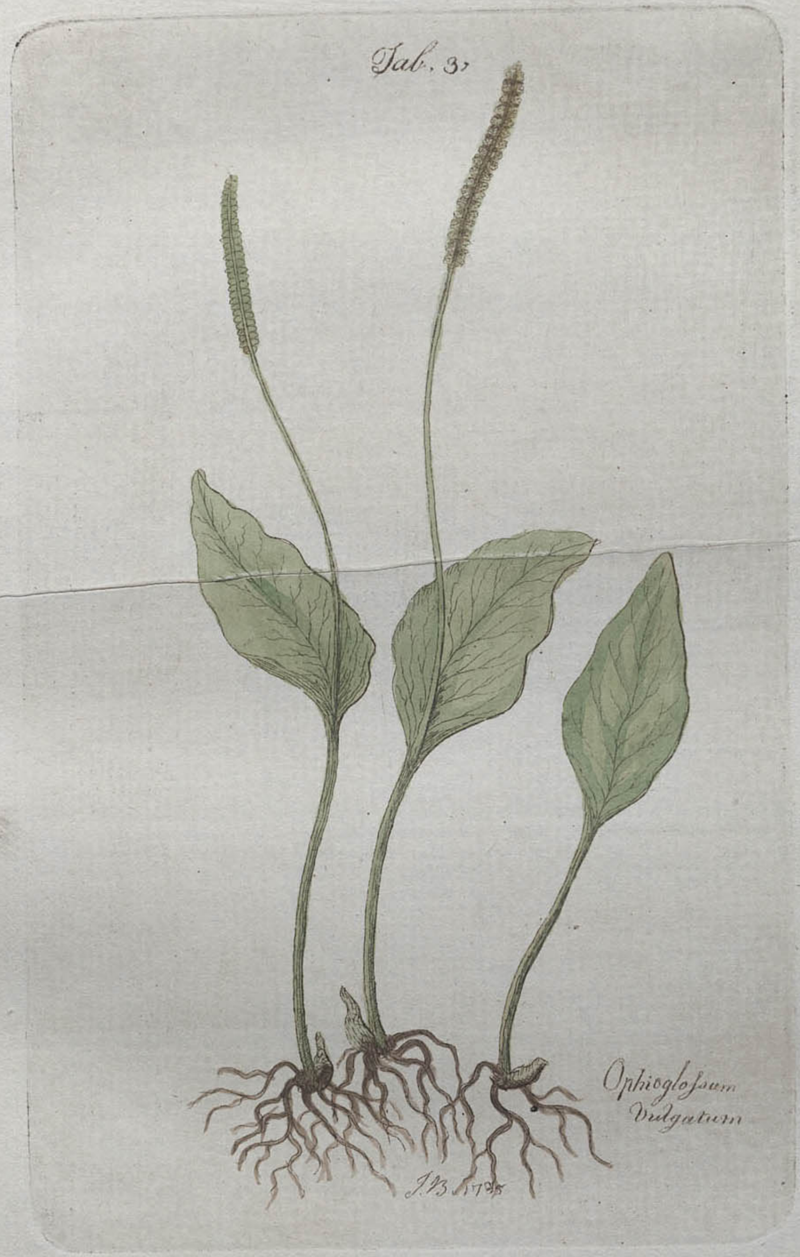
ADDERS TONGUE.

THE root conſiſts wholly of fibres, often furniſhed with a bulb-like hybernaculum, which contains a ſucceeding plant in embrio.

The proper ſtalk is green, flattiſh, from two to four inches high, ſupporting one leaf at the top; the leaf is tongue-ſhaped, two inches long, thick, gloſſy, ſucculent, and of a firm ſubſtance, varying in colour from a light to a dark green.

Seed veſſels arranged in two rows, and forming a jointed ſpike, the rows placed oppoſite; when ripe, they burſt tranſverſely, and diſcharge ſmall ſeeds; the ſpike is ſupported on a ſtalk two or three inches high, ariſing from the point where the tongue-ſhaped leaf is united to the firſt ſtalk, by the bottom of which leaf the ſpike ſtalk is partly ſurrounded and embraced.

VARIETIES.



VARIETIES.

Adders tongue is ſometimes found with a ſpike ſtalk divided at the top, each diviſion ſupporting a ſeparate ſpike, *ſee Ger. Em.* 405; and *Tab.* 2. *Fig.* 1. Sometimes the leaves are a little gaſhed, or lobed, on one or both ſides; and ſometimes have ſmall appendages on one or both ſides.

Ophioglоſſum Vulgatum grows in cold meadows and paſtures, where the ground is moiſt, in the neighbourhood of Halifax; particularly in a meadow adjoining to Mytham-Bridge, a mile from Halifax, in the way to Wakefield.

The ſeedſpikes are in perfection about the beginning of June.

OSMUNDA

OSMUNDA. *Lin. Gen. Plan.* 1172.

OSMUNDA *Lunaria*. *Lin. Sp. Pl.* 1519. *Ray Syn.* 128. *Flo. Scot.* 652. *Flo. Ang.* 449. *Ger. Em.* 405. *Park.* 507.

TAB. IV.

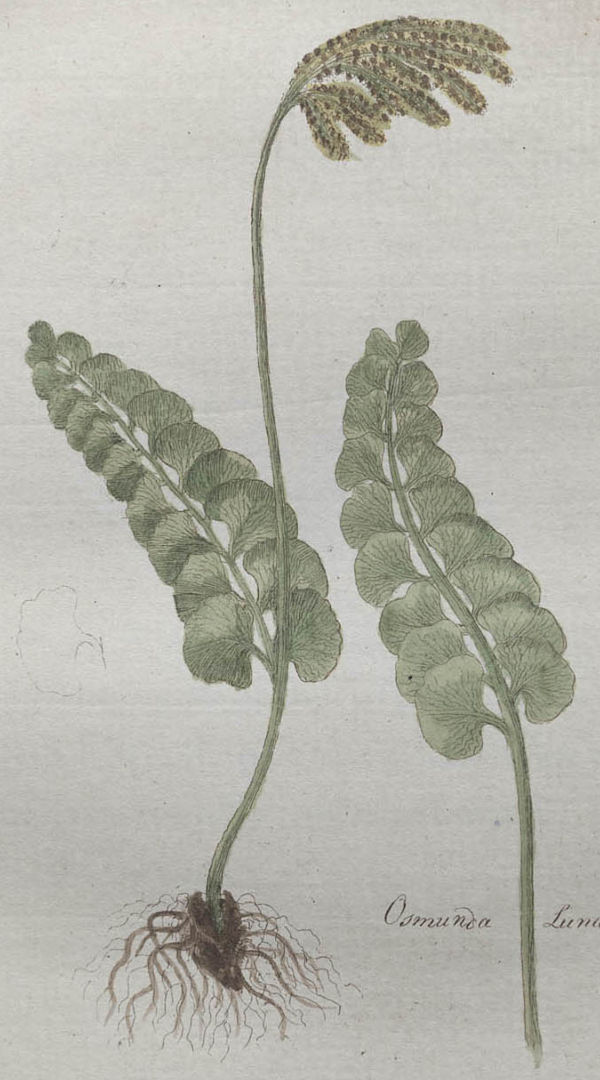
MOONWORT.

THE root is compoſed of fibres adhering to the bottom of the ſtem, and to the bulb-like embrio of a future plant.

The leaf ſtalk is two or three inches high, firm, ſolid, and ſometimes a little flattiſh; it ſupports one pinnated leaf, compoſed of eight or nine pairs of kidney-ſhaped lobes, ranged ſo cloſe on the nerve as to lie over each other in an imbricated order, the loweſt pair largeſt, decreaſing gradually upwards, and a ſingle one, the ſmalleſt, terminating the nerve at top.

Seed veſſels ſupported on a ſtalk two or three inches high, growing from the top of the leaf ſtalk at the inſertion of the leaf; it is divided into ſeveral branches near the top, to which branches the ſeed veſſels are affixed

Tab. 4.



Osmunda Lunaria

in ſeveral rows, in imitation of ſpikes, the whole forming a handſome bunch pendent on one ſide, at firſt of a very pale greeniſh white, brown when ripe; and the ſeeds, when diſcharged, appear as if covered with a brown duſt.

There is a variety with compound or branched leaves, *ſee Ger. Em.* 406. *fig.* 3.

Oſmunda Lunaria grows amongſt graſs in cold meadows and paſtures.

In paſtures about Cold Edge, in Mixenden; in a ſmall croft cloſe by the houſe at Ball-Green, Sowerby; in the fields near Holy-Green, Northowram; and ſome other places in the neighbourhood of Halifax.

The plant is in its greateſt perfection the firſt or ſecond week in July.

On the ninth day of June 1785, I gathered on the top of an high bank of paſture ground, belonging to Shibden-Hall, near Halifax, a variety of Oſmunda Lunaria, with leaves ſhaped like a lady's fan when fully expanded, divided by narrow ſections running almoſt down to the baſe into four or five lobes, which are deeply crenated at their extremities.

OSMUNDA regalis.

Lin. Sp. Pl. 1551. *Flo. Scot.* 653. *Flo. Ang.* 449. *Park.* 1038. *Ger. Em.* 1131.

TAB. V.

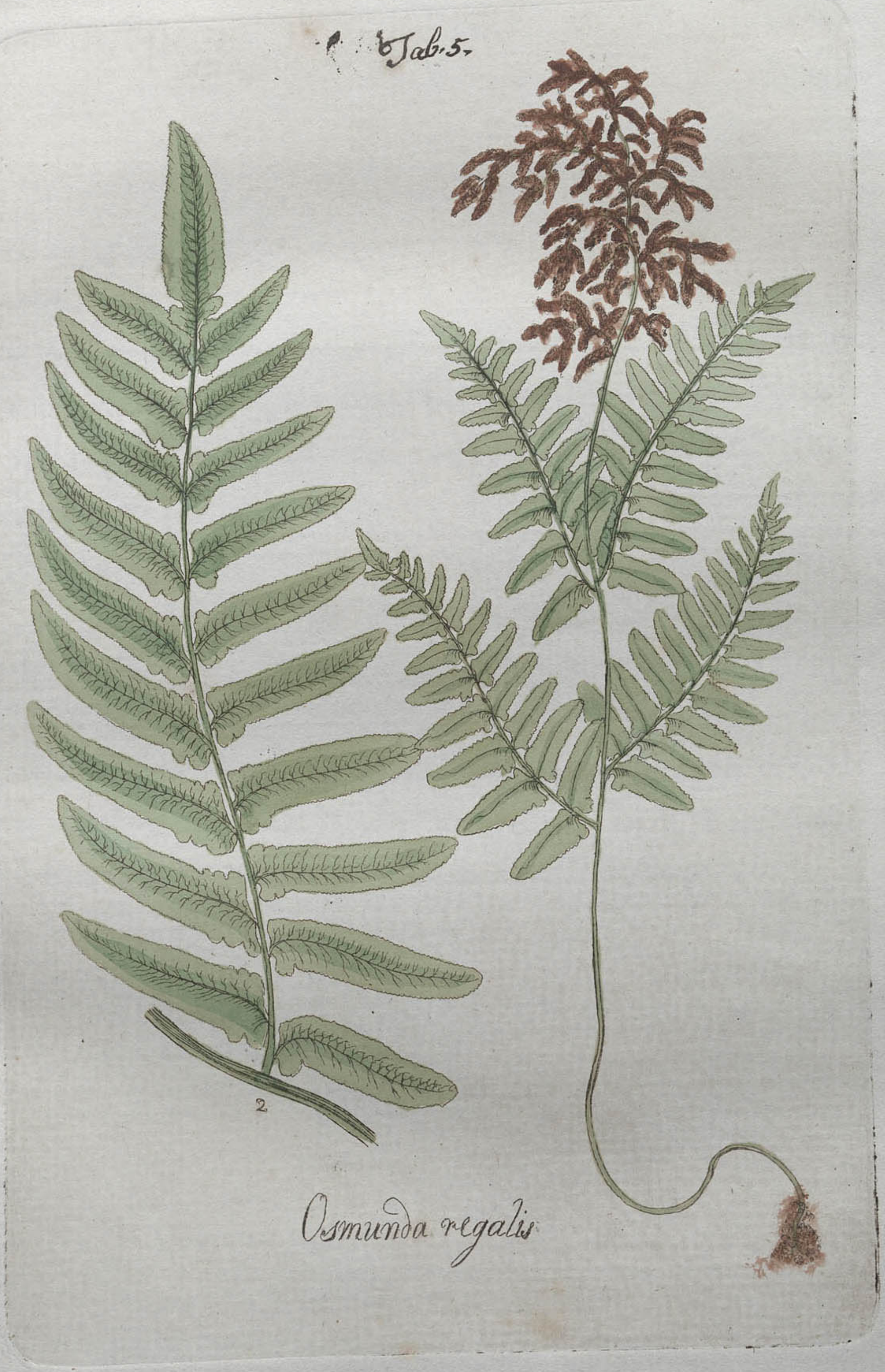
OSMUND ROYAL.

THE root is large, thick, hard, and woody, firmly fixed in the tough mire by its numerous long ſtringy fibres, and is cloſely covered by ſeveral folds of tough brown ſcales.

The firſt leaves are from two to four feet high, of an elegant longiſh oval ſhape; the rib ſmooth and gloſſy, having an hollow furrow on the upper ſide, round or gibbous on the under ſide, and naked a good way from the root.

Second leaves from ſix to ten pairs, the third or fourth pair from the root longeſt, thence to the top ſhortening by a ſudden gradation; they are placed at an acute angle with the rib of the firſt leaf.

Lobes from five to ten pairs, tongue-ſhaped, irregularly lobed at their bottoms; the firſt pairs for half their number of equal length, thence to



Osmunda regalis

the top gradually diminiſhing, where they are terminated by a broad diſtinct lobe often having one or more appendages at its baſe ; theſe are the barren leaves, *ſee fig.* 2. where one of the ſecond leaves is repreſented of its natural ſize.

Seed veſſels, produced in large bunches at the ſummit of the fertile firſt leaves ; theſe leaves grow from the central part of the root, and reſemble the barren firſt leaves till the fourth or fifth pair of ſecond leaves, above which the rib terminates in a large pendent divided and ſubdivided bunch of ſhort cylindrical ſpikes of ſeed veſſels ; at firſt green, when ripe of a brown colour, and after the ſeeds are diſcharged appear as if covered with duſt.

The whole plant is of a bright freſh green, and very elegant.

Oſmund Royal grows in bogs and clay grounds ; in a little bog, in a field under Hadderſhelf-Scout, in Sowerby ; in a field near Mixenden Mill, and ſome other places in the pariſh of Halifax.

OSMUNDA ſpicant.

Lin. Sp. Pl. 1522. *Ray Syn.* 118. *Flo. Scot.* 654. *Flo. Ang.* 450. *Ger. Em.* 1140. *Park.* 1042.

TAB. VI.

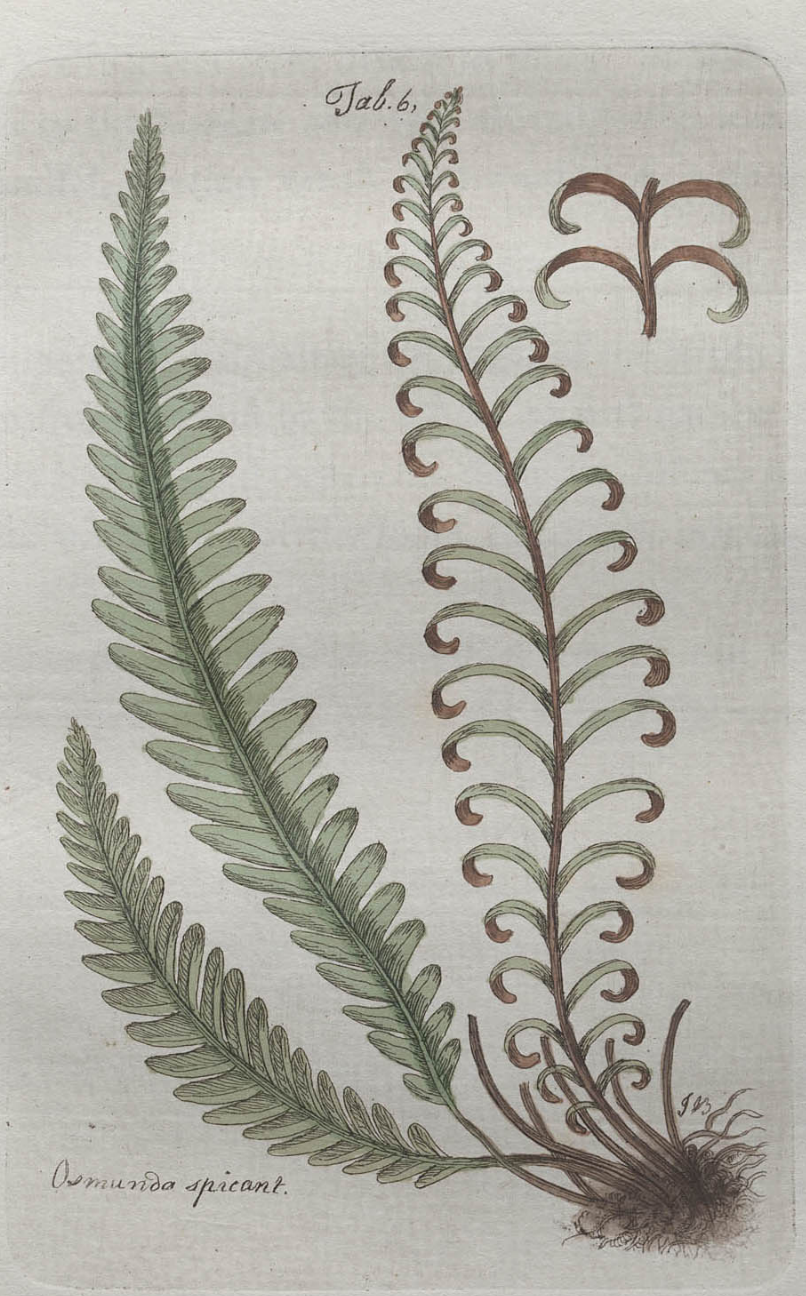
ROUGH SPLEENWORT.

THE root is of an irregular figure, hard and firm, covered with black ſcales, and furniſhed with many black fibres; when old they become large by reaſon of the ſtumps of many decayed leaves which abide upon them.

The barren leaves which riſe from the circumferent part of the root are ſimply pinnate, lance-ſhaped, terminating in a point both below and above, from five to twelve inches high; the rib brown and gloſſy near the root, green above; whole leaf of a bright green colour.

Lobes of the barren leaves, from fifteen to thirty, lance-ſhaped, oppoſite or alternate, curved gently upwards, parallel, firſt pairs very ſhort, confluent, and decurrent at their baſe, gradually lengthening to the middle, and thence growing ſhorter to the top, where they are narrow, cloſe, and diſtinct.

Fertile



Tab. 6,

Osmunda spicant.

Fertile leaves longer than the barren, like them ſimply pinnate, and of the ſame general ſhape; ſtem red, brown, and gloſſy.

Lobes on the fertile leaves from fifteen to thirty, longeſt in the middle, gradually ſhorter to the bottom and top of the fertile leaf, of a narrow linear ſhape, parallel, curving much backwards, of a dark gloſſy green above.

Seed veſſels diſpoſed in lines along the edges of the fertile lobes, the lines of equal breadth from one end to the other, at firſt narrow and of a pale green, afterwards brown, and, when the ſeeds are diſcharged, encreaſing ſo as to cover the whole diſk of the lobe, except the middle nerve.

The fertile leaves decay ſoon after the diſcharge of the ſeed; the barren leaves in warm places continue green moſt part of the winter; both are renewed in the ſpring.

Grows about old walls, rocks and rivulets, in woods, by road ſides, and on moors; in Birks wood, near Halifax, abundantly.

Scopoli makes this plant a Struthiopteris, *ſee Flora Carniolica, Ed. Secunda, Tom.* 2, *Pag.* 288, *No.* 1258.

OSMUNDA criſpa.

Lin. Sp. Pl. 1522. *Ray Syn.* 126. *Flo. Scot.* 655.
Flo. Ang. 450.

TAB. VII.

CURLED STONE FERN.

THE root conſiſts of a multitude of ſlender fibres, much entangled with one another, and of a pale brown colour.

Barren firſt leaves from three to nine inches high, approaching in the general figure to an irregular oval; rib waved and green.

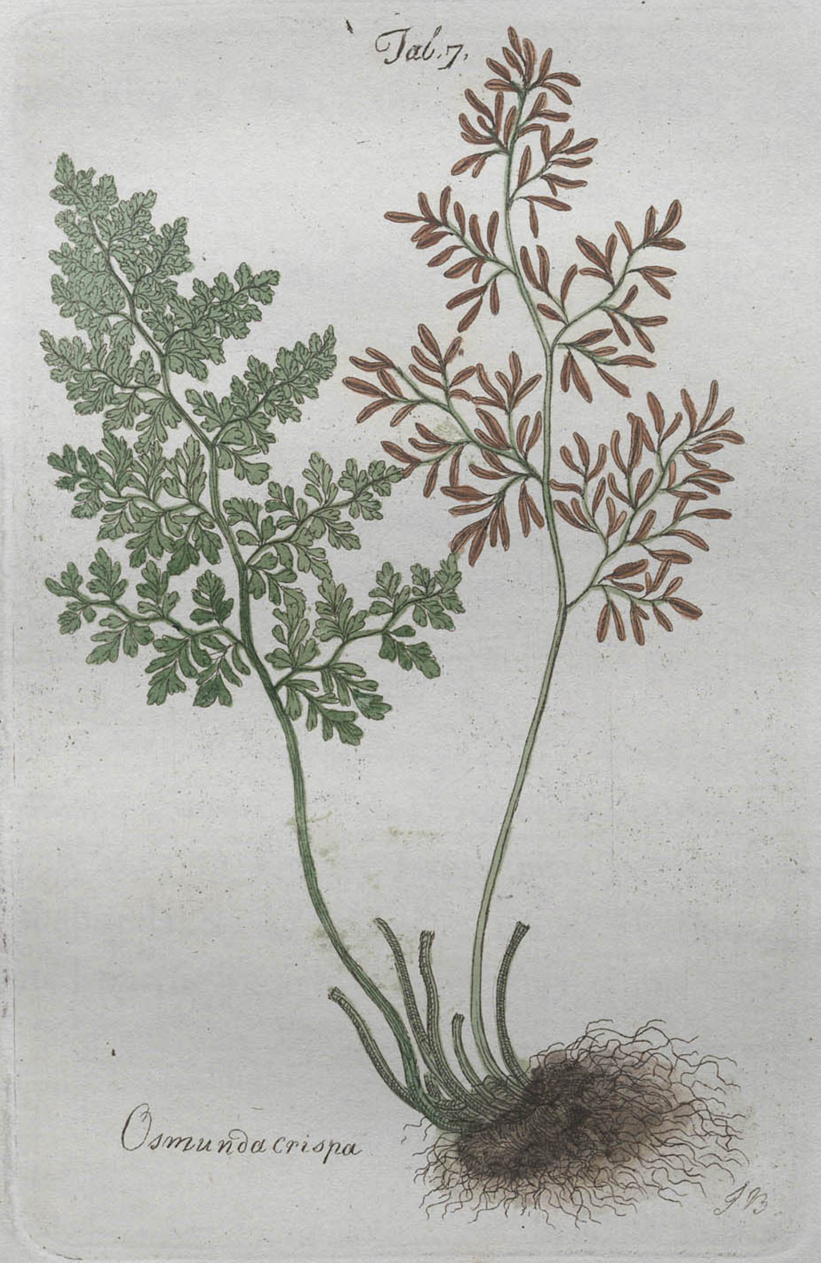
Second leaves ſame general ſhape with the firſt, ſix or eight pairs placed alternately, diminiſhing from firſt to laſt; rib waved.

Third leaves ſhaped like the firſt and ſecond, four or five pairs placed alternate.

Lobes of the barren leaves two or three pairs, dented at the extremity with one or two dents, ſo that the lobes themſelves are again lobed, the loweſt pair generally with three, the next pairs with two, and the terminal with three or four of theſe leſſer lobes; whole leaf a bright green.

Fertile

Tab. 7.



Osmunda crispa

Fertile firſt leaves taller than the barren, of the ſame general figure, and of a darker green; ſecond leaves four or five pairs placed alternately, diminiſhing to the top, and terminating in a ſingle lobe.

Third leaves conſiſting of two or three pairs of lobes with ſingle ones interſperſed.

Lobes ſimple, oblong, one third of an inch in length, rolled back at the edges, and of a thick firm ſubſtance.

Seed veſſels placed in lines on the under margin of the fertile lobes, at firſt of a whitiſh colour, when ripe of a yellow brown, and, after the diſcharge of the ſeeds, encreaſing in breadth ſo as to cover the whole diſk of the lobe, except the middle nerve.

Oſmunda Criſpa grows on Ingleborough-Hill, Yorkſhire; on Hombleton-Hill, near Burnley; under the great rocks at Clibberſhaw-Dean, near Todmorden, *Mr. Wood*; in Knotty-Lane, near Saddleworth-Ray, Lancaſhire; but moſt abundantly on Snowdon, where I gathered the ſpecimen which is repreſented on the plate in Auguſt A.D. 1784.

ACROSTICHUM.

ACROSTICHUM.

Lin. Gen. Plan. 1173.

ACROSTICHUM ſeptentrionale.

Spec. Plan. 1524. *Ray Syn.* 120. *Flo. Scot.* 656. *Flo. Ang.* 450.
Ger. Em. 1561. *Park.* 1045.

T A B. VIII.

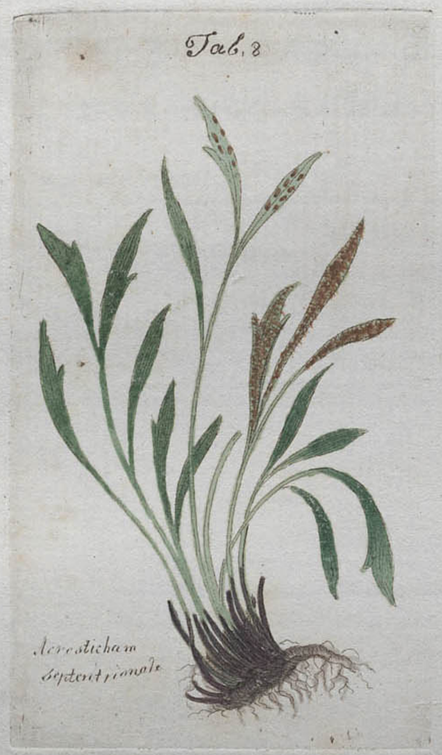
FORKED MAIDEN HAIR.

THE root conſiſts of a number of fine, ſlender, brown fibres, connected to a ſmall head.

The leaves from two to five inches high, linear and ſlender for more than half their length; above, they divide ſometimes into two, ſometimes into three or four lobes.

The lobes are about an inch in length, lance-ſhaped, one ſixth of an inch in breadth, and veined lengthways; ſometimes theſe lobes are intire, but often irregularly cut in on the edges, and forming little acute appendages on the ſides, which are curved outwards.

Seed veſſels firſt appear in ſmall indiſtinct lines or dots on the back of the lobes, afterwards they flow together, and when the veſſels burſt, and the


Tab. 8

ſeeds are diſcharged, cover the whole diſk of the lobe with a thick cloſe brown nap, which is the diſtinguiſhing characteriſtic of the Genus Acroſtichum, as at preſent eſtabliſhed.

Forked Maiden Hair. Grows on Ingleborough-Hill; *Mr. Toſield. Flo. Ang.* 451.

The ſpecimens figured, I gathered in a garden from roots that had been brought from the King's Park, near Edinburgh, in Scotland; it grows there out of the clifts of the rocks about Arthurs Seat. *Mr. Lightfoot.*

ACROSTICHUM Ilvenſe.

Spec. Pl. 1528. *Ray Syn.* 118. *Flo. Ang.* 451.

TAB. IX.

HAIRY ACROSTICHUM.

THE roots are ſmall, and furniſhed with a few black hard fibres.

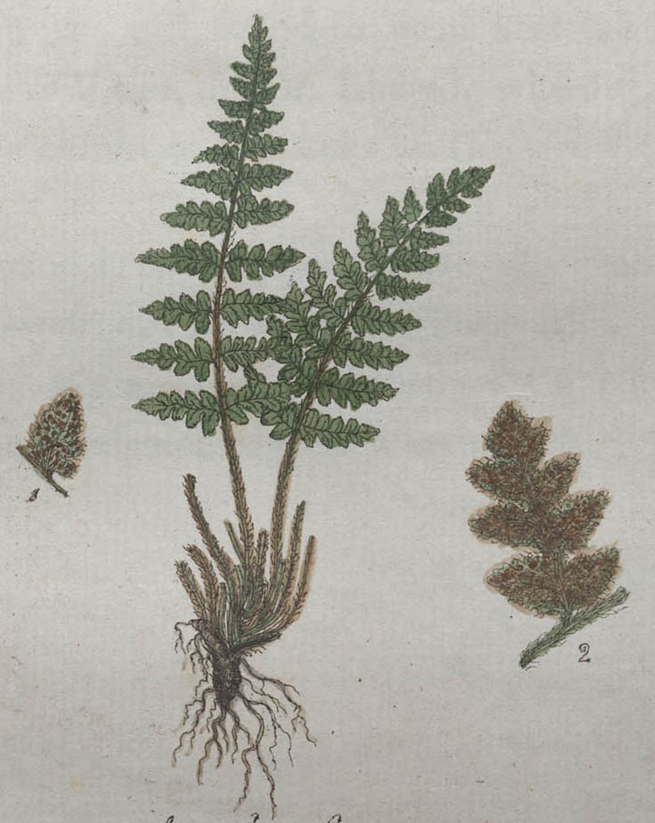
Firſt leaves from three to five inches long; the rib hairy, deſtitute of leaves almoſt half its length from the root; general ſhape of the leaf tapering from the baſe to the point.

Second leaves from ſeven to fifteen pairs, loweſt pairs largeſt and oppoſite, thence to the top becoming gradually leſs and alternate, and, near the ſummit, confluent at their baſe.

Lobes five or ſix of an oblong figure with ſeveral dents on the edges, firſt pair largeſt, thence decreaſing to the point, where one or two pairs become confluent, united almoſt their whole length; all of them broadeſt at the baſe, where they are confluent and decurrent.

Seed

Tab. 9.



Acroſtichum ilvenſe.

Seed veſſels firſt appear in round dots diſperſed on the back of the lobes, which are covered with brown hairs ; after the ſeed veſſels are burſt, and the ſeeds diſcharged, the whole under ſide of the lobe appears covered with an hairy roughneſs, of a brown colour. *See Tab.* 9, *where Fig.* 1 *is a pinnula or lobe, and Fig.* 2, *a pinna or ſecond leaf magnified, to ſhew the ſeed veſſels and hairs.*

Hairy Acroſtichum was firſt found to grow near the top of Snowdon, the higheſt mountain in Wales, by Dr. Lhwyd, who diſcovered it growing horizontally from the chinks of the rocks on *Clogwyn y Garnedh.*

Dr. Richardſon found it on *Clogwyn y Garnedh*, near the top, on the ſide facing the north-weſt, directly above the lower lake. Mr. Hudſon ſaw it in the ſame place. My figure was taken from a fine ſpecimen gathered there, and now in the poſſeſſion of a noble naturaliſt.

PTERIS.

PTERIS.

Lin. Gen. Plan. 1174.

PTERIS aquilina. *Sp. Plan.* 1533. *Ray Syn.* 124. *Flo. Scot.* 656. *Flo. Ang.* 451. *Ger. Em.* 1128. *Park.* 1037.

TAB. X.

BRAKES.

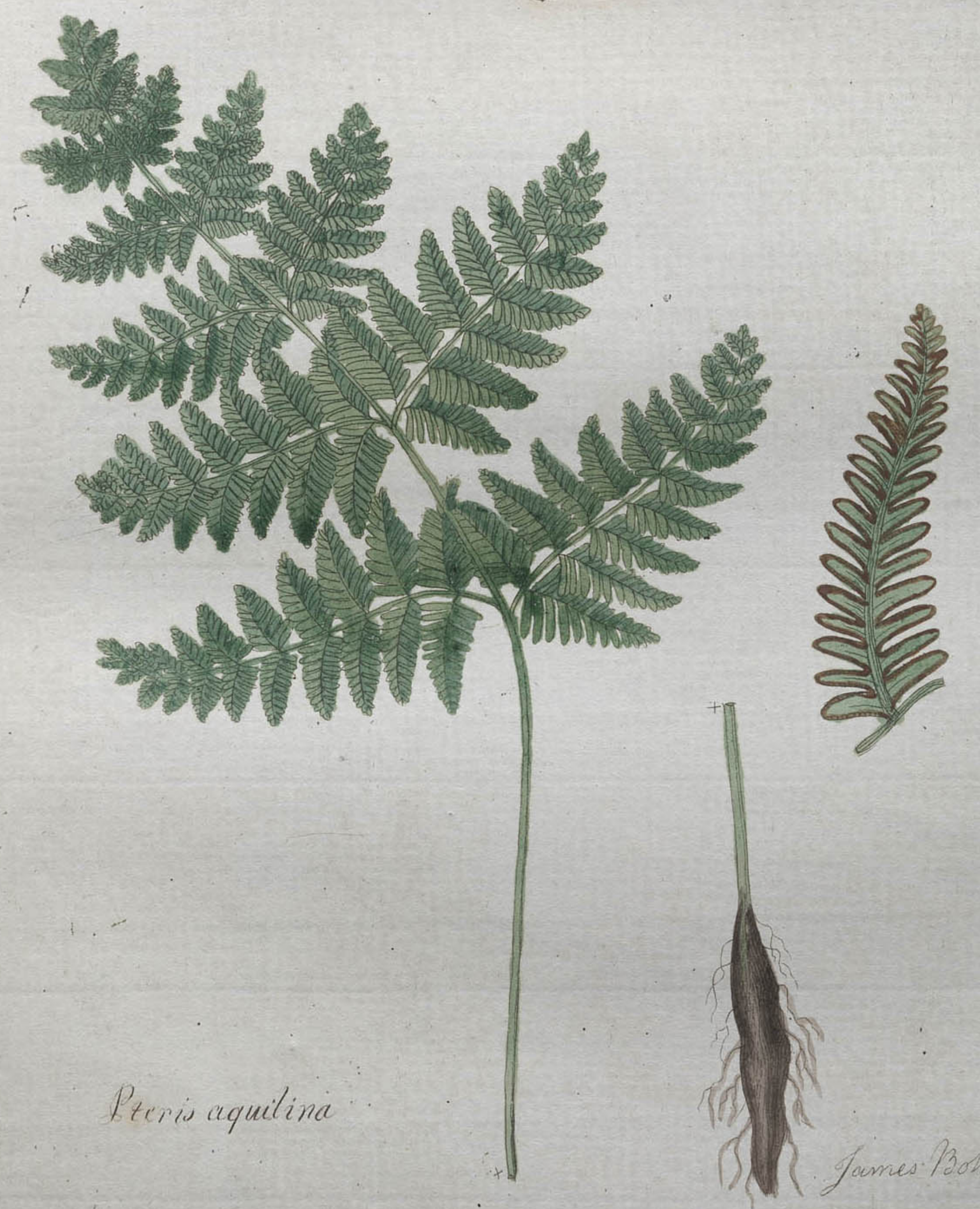
THE root, from the bottom of the ſtem, ſtrikes down into the ground perpendicularly for three or four inches; afterwards is curved, and creeps horizontally in the ground, is there branched, hard, woody, and as thick as the little finger, covered with a black bark, and fibrous.

Firſt leaves from one to three feet in height; ſtem or rib ſmooth, hard, of a pale green colour, and gloſſy; deſtitute of leaves for half its length from the root; general figure of the firſt leaves triangular.

Second leaves eight or ten pairs, placed oppoſite; their general ſhape triangular, and diminiſhing from the loweſt to the higheſt.

Third

Tab. 10.



Pteris aquilina

James Bolton d. et sculp.

Third leaves eight or ten pairs, placed oppoſite, and diminiſhing from the loweſt to the higheſt.

Lobes eight or ten pairs, divided down to the nerve, of an oblong figure, terminating in an obtuſe point, the verges a little rolled back, and, while young, feeling downy to the touch.

Seed veſſels diſpoſed in lines under the edges of the lobes, (which is the characteriſtic of the genus,) at firſt white, afterwards brown ; when the ſeeds are diſcharged, the lines become broader and more conſpicuous, but never cover the diſk of the lobes, as all the acroſticha, and many of the aſplenia do.

The plate repreſents a third leaf of the natural ſize with the ſeed veſſels.

Brakes, (in Yorkſhire, brackens,) grow about the ſkirts of barren moors, and in ſuch waſte places where the badneſs of the ſoil renders the ground not worth cultivating.

ASPLENIUM.

Lin. Gen. Plan. 1178.

ASPLENIUM ſcolopendrium.

Linn. Spec. Plan. 1537. *Ray Syn.* 116. *Flo. Scot.* 660. *Flo. Ang.* 452. *Ger. Em.* 1138. *Park.* 1040.

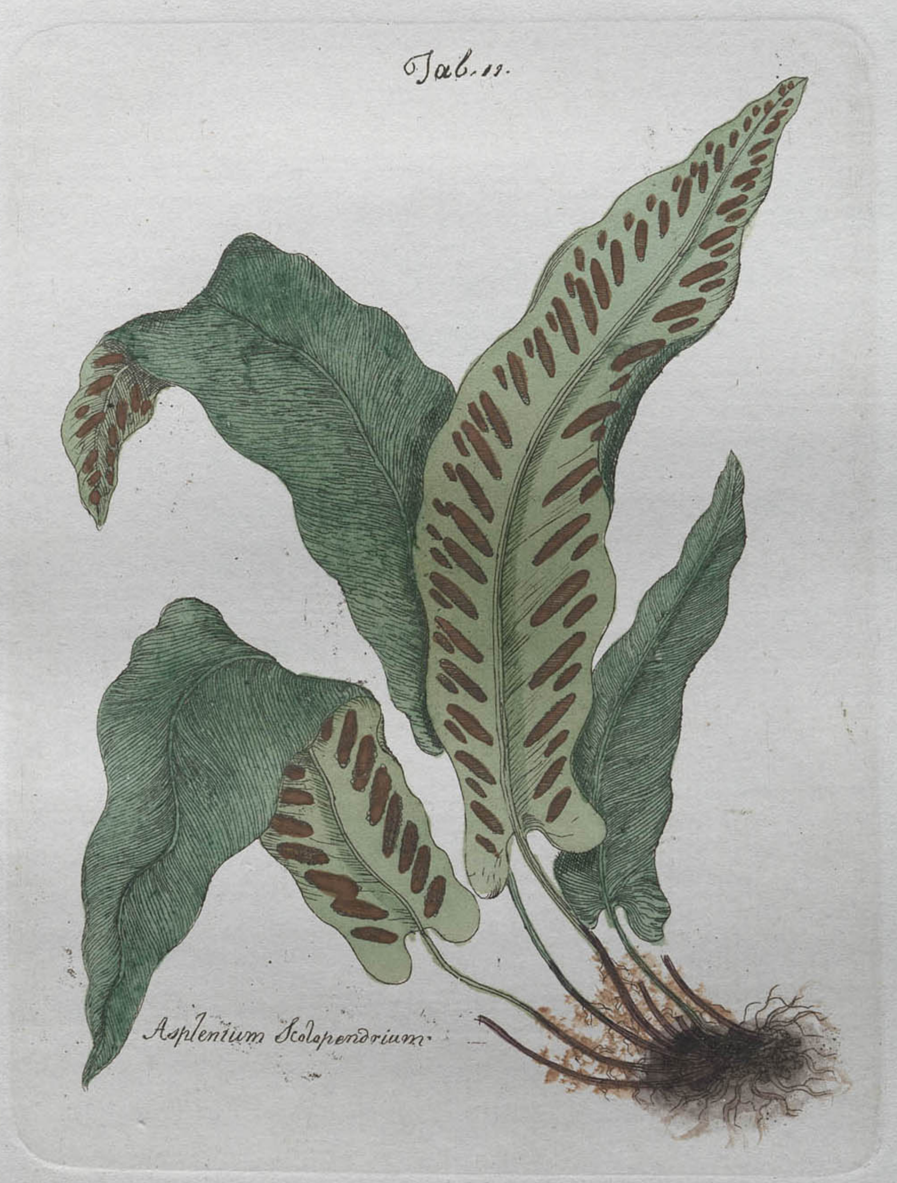
TAB. XI.

HARTS TONGUE.

THE root is black, hard, covered with ſcales, and emitting numerous ſtrong black fibres.

Leaves from five to twelve inches long, lance-ſhaped above, the two ſides rounded at the bottom, ſo as to give a cordated appearance to the lower extremity of the leaf, and receiving the rib in the hollow dent; the rib is brown or blackiſh, hard, gloſſy, having brown chaffy ſcales, and is deſtitute of leaf about one-third of its length; the leaf is hard, tough, and firm to the touch, with numerous parallel veins running obliquely from the central nerve to the margin, of a dark ſhining green above, paler underneath, and often more or leſs undulated at the edge.

Seed



Seed veſſels on the under ſide of the leaves, in lines running obliquely from the nerve to the margin; ſometimes there are two ſeries of theſe lines of ſeed veſſels from the top of the leaf to the bottom, the lines of the inner ſeries much larger than theſe of the outer one, all of them running parallel; often there is but a ſingle ſeries on each ſide of the rib; and ſometimes the lower part of the leaf is barren.

When the ſeed veſſels are ripe, and burſt, the lines become broader, and ſeem covered with a brown duſt. The ſeeds being diſpoſed in lines on the prone diſk of the leaf characteriſes the Genus Aſplenium.

Harts Tongue grows amongſt rocks; in the deep clifts between the rocks in Whiteſcars and Scar Cloſe near Ingleborough abundantly, where I have ſeen the leaves twenty-four inches long.

It grows in a little woody brow, called Toad-Holes, in Sowerby Dean, four miles from Halifax.

ASPLENIUM ceterach.

Lin. Sp. Pl. 1538. *Ray Syn.* 118. *Flo. Scot.* 661.
Flo. Ang. 452. *Ger. Em.* 1139. *Park.* 1046.

TAB. XII.

SPLEENWORT.

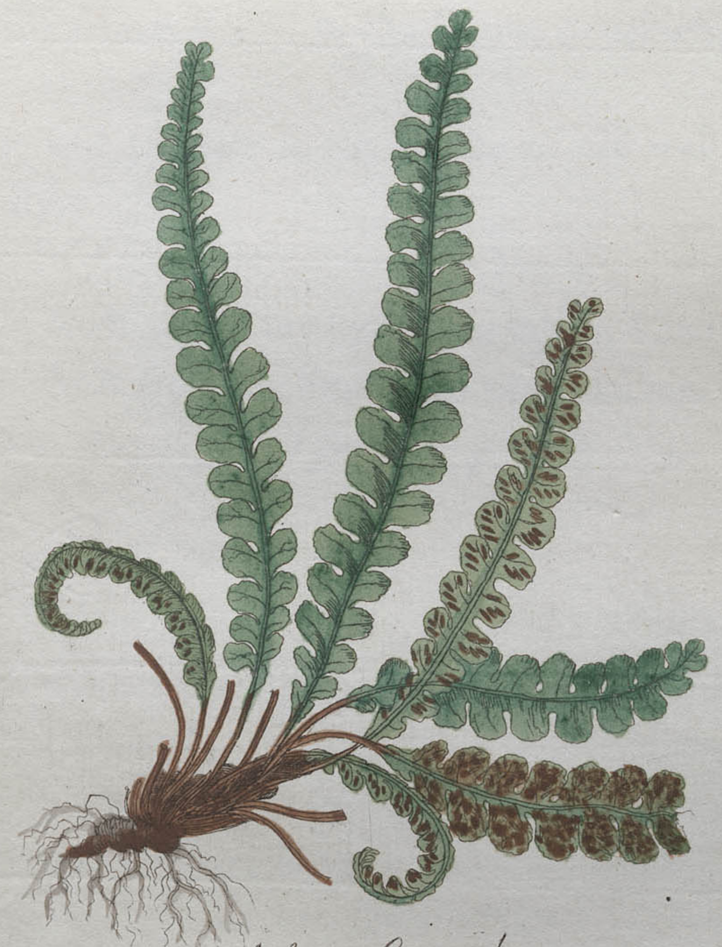
THE root conſiſts of many fibres adhering to a ſhort ſhapeleſs head, which is ſurrounded thickly by the ſtumps of decayed leaves, and is of a dark-brown colour.

The leaves are from three to five inches long, ſemi-pinnate, and lance-ſhaped; the nerve brown towards the bottom, and naked for a little way from the root.

The lobes are about twenty pairs, ſhort, broad, roundiſh, intire, but waved on the edges, largeſt in the middle of the leaf, diminiſhing gradually both upwards and downwards, the uppermoſt placed obliquely, all of them confluent, and decurrent at the baſe, of a dark ſhining green on the upper ſide; when the plant is old, the lobes of the leaf roll together inwardly, and hide their ſmooth ſurfaces.

Seed

Tab. 12.



Asplenium Ceterach.

Seed veſſels make their firſt appearance in three or four ſhort pale coloured lines, placed obliquely on the under ſide of the lobe near its middle nerve on each ſide.

As the plant advances in growth, the ſeed veſſels enlarge, turn brown, and, when burſt, run together and cover the whole diſk of the lobes with their brown duſty filaments, as in the Genus Acroſtichum.

Spleenwort is ſaid to grow in the chinks of old walls and rocks about Briſtol plentifully.

The ſpecimen from which my figure was taken, I had from a perſon who told me he brought it from the lime rocks near Malham Tarn, in the place mentioned by Mr. Ray; *ſee 3d ſynopſis, p.* 118.

ASPLENIUM trichomanes.

Linn. Sp. Plan. 1540. *Ray Syn.* 119. *Flo. Scot.* 662. *Flo. Ang.* 452. *Ger. Em.* 1146. *Park.* 1051.

TAB. XIII.

ENGLISH MAIDEN HAIR.

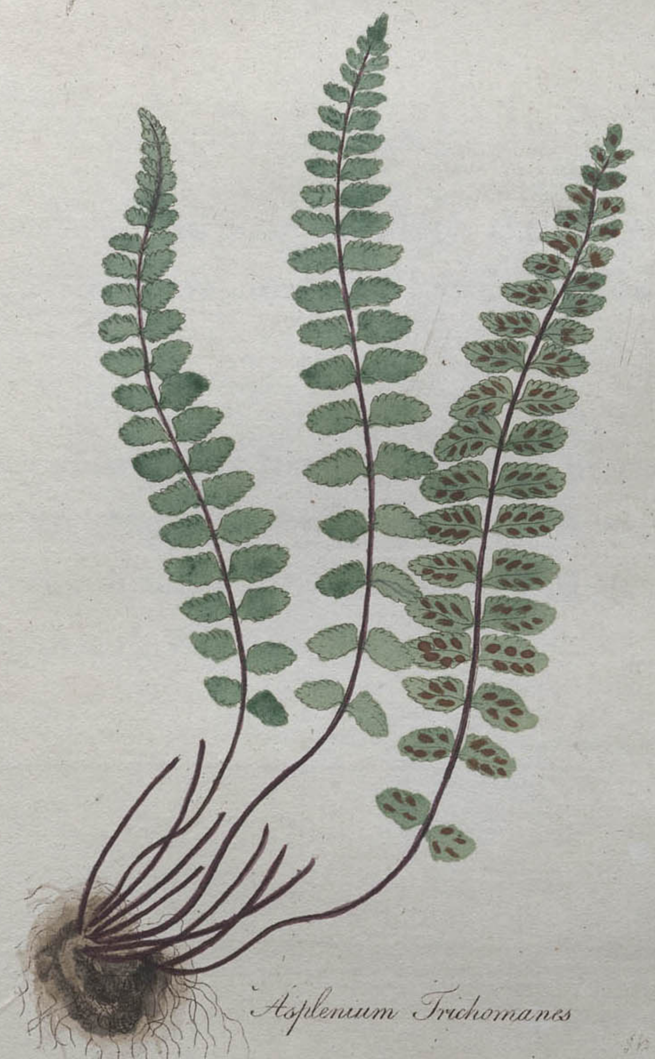
THE roots are very ſmall, conſiſting of brown capillary fibres looſely affixed in the crevices of moiſt rocks.

Leaves five or ſix inches long; the rib of a blackiſh purple colour, ſmooth, hard, ſhining, and is deſtitute of leaf about one-third of its length from the root. The general figure is lance-ſhaped.

Lobes fifteen or twenty pairs, the loweſt pairs moſt remote, the reſt nearer and nearer by a ſlow gradation to the top, all of them placed oppoſite; their figure approaches to an oval, largeſt below, gibbous on the upper ſide at the baſe, and obliquely cut off on the lower, rounded or blunt at the extremity; the lobe is crenated with ten or twelve dents, its baſe above and below entire.

Seed

Tab.15.



Asplenium Trichomanes

Seed veſſels make their firſt appearance in two or three white lines placed obliquely on each ſide of the nerve on the back of the lobes; when they are advanced in growth the colour becomes darker; at laſt they burſt, diſcharge the ſeeds, and ſpread themſelves, but not ſo as to cover the whole diſk.

VARIETIES.

There is a variety of this plant in which the lobes are ſubdivided, and the ſubdiviſions elegantly crenated and lobed, *ſee Tab.* 2. *Fig.* 2. but this variety is rare.

Engliſh Maiden Hair grows from the crevices of moiſt rocks, near rivulets, on Snowdon and Ingleborough; on rocks about Ogden Kirk; on the moiſt rocks near the Pitcher Pit, in Soyland Mills Clough; and other places in the neighbourhood of Halifax.

ASPLENIUM viride.

Hud. Flo. Ang. 453. *Ib. Ed. prim.* 385. *Flo. Scot.* 663.

TAB. XIV.

LESSER ENGLISH MAIDEN HAIR.

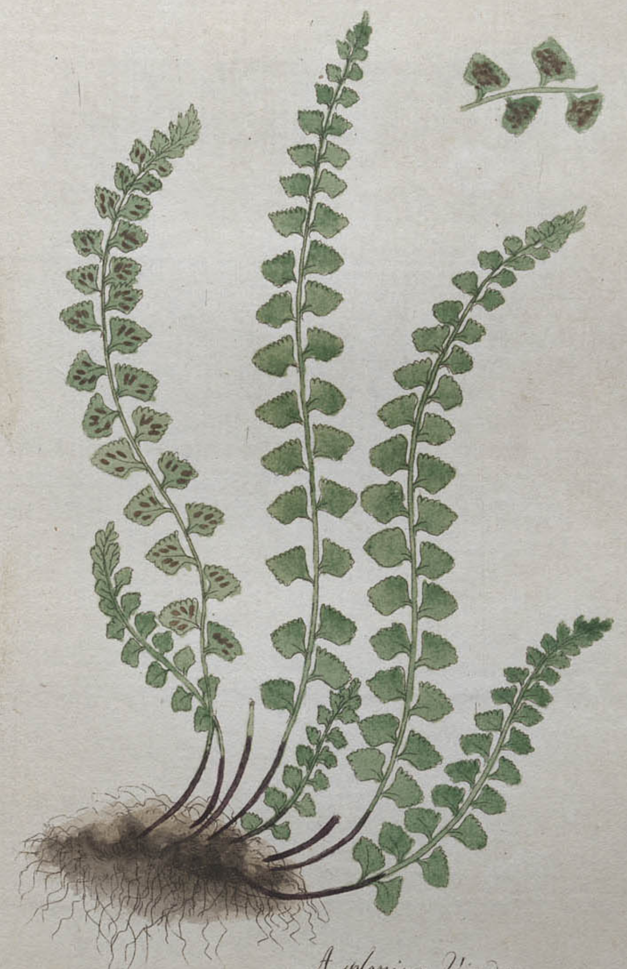
THE root is ſmall, ſhort, covered with brown ſcales, and furniſhed with a multitude of capillary entangled brown fibres.

Leaves ſimply pinnate, four or five inches long, lance-ſhaped, but ſomewhat narrow; the ribs tender, often of a pale green colour, ſometimes browniſh towards the root. I have ſpecimens, wherein the bottom part of the rib is brown and gloſſy, as in the Aſplenium trichomanes.

The lobes eighteen or twenty pairs, ſometimes alternate, ſometimes oppoſite, ſhort, broad, of a rhomboidal figure, or irregular ſquare of four unequal ſides, attached to the rib by one of the angles, the upper and lower ſides of the baſe entire, the other two crenated, the upper with ſix or ſeven dents, the lower with four or five.

Seed

Tab. 14.



Aſplenium Viride

Seed veſſels firſt appear in two or three white oblong ſpots on the under ſide of the diſk about the centre; they afterwards turn of a yellowiſh brown, and, when burſt, become conſluent, covering the central part of the diſk with a browniſh nap; which laſt circumſtance, together with the figure of the lobes, are ſufficient to characterize the ſpecies, and to diſtinguiſh it from the Aſplenium Trichomanes.

VARIETIES.

I have ſeen a variety of this plant with the leaves branched, the rib of the firſt leaf throwing out other ribs furniſhed with lobes like the firſt, but ſmaller: this variety I gathered on the rocks below Ogden Kirk, on the oppoſite ſide of the Clough, A. D. 1783.

Is this variety the Aſplenium Trichomanes ramoſum of Linnæus? *ſee Tab.* 2. *Fig.* 3.

Green Maiden-Hair grows on Ingleborough Hill in Yorkſhire; on the mountains of North Wales abundantly; from the chinks of moiſt rocks, beſide the Clough below the Great Rock called Ogden Kirk, four miles from Halifax.

ASPLENIUM marinum.

Sp. Pl. 1540. *Ray Syn.* 119. *Flot. Scot.* 664. *Flo. Ang.* 453.
Ger. Em. 1143. *Park.* 1045.

TAB. XV.

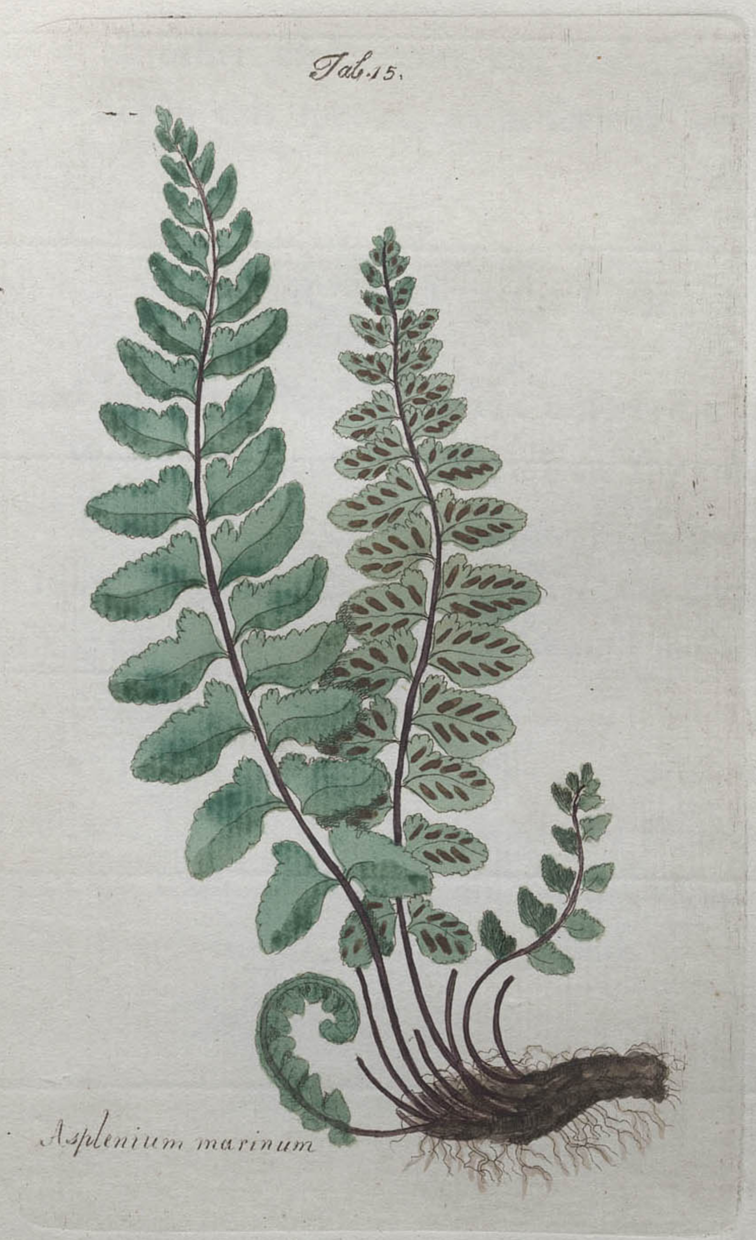
SEA SPLEENWORT.

THE roots are brown, tough, and hard, full of fibres, and firmly fixed in the narrow chinks of the rocks.

The leaves are ſimply pinnate, five or ſix inches long, lance-ſhaped, blunt at the baſe; the rib hard, firm, of a purpliſh black, ſmooth and ſhining; upper ſide a dark full green, paler below.

Lobes from ſeven to twenty pairs, oblong, with a remarkable expanſion on the upper margin near the baſe, and on the lower ſide obliquely cut off; baſe, both above and below the nerve, entire; extremity of the lobes rounded or bluntly terminated; all except the baſe crenated on the edges, with fifteen or ſixteen dents on the upper ſide of the nerve, nine or ten on the lower.

Seed



Seed veſſels placed in lines on the under ſide of the lobes, four or five of theſe lines on each ſide of the nerve running obliquely.

In this, as in all other aſpleniums, the ſeed-lines, when burſt, become broader, but do not in this ſpecies, as in ſeveral, cover the whole under ſide of the lobes.

VARIETIES.

The Rev. and ingenious Mr. Lightfoot obſerved a variety of this plant in the caves at Weems, in Scotland, which he ſuppoſes to be the ſame as deſcribed by Sibbald in his Scotia Illuſtrata, p. 7, part 2; and which the author of the Flora Anglica has named Adiantum trapeziforme. For the ſatisfaction of the curious I have copied Sibbald's figure; *ſee Tab.* 2. *Fig.* 4.

Sea Spleenwort is ſaid to grow on rocks in the Iſle of Angleſea; about the ſhores of Suſſex, Devonſhire, Cornwall and Cumberland. The ſpecimen from which I took my figure and deſcription, I gathered from a rock in the ſide of a ſtone pit, or quarry, cloſe by the road leading from Warrington to Winwick, in Lancaſhire.

ASPLENIUM ruta-muraria.

Lin. Sp. Pl. 1541. *Ray Syn.* 122. *Flo. Scot.* 665.
Flo. Ang. 453. *Ger. Em.* 1144. *Park.* 1050.

TAB. XVI.

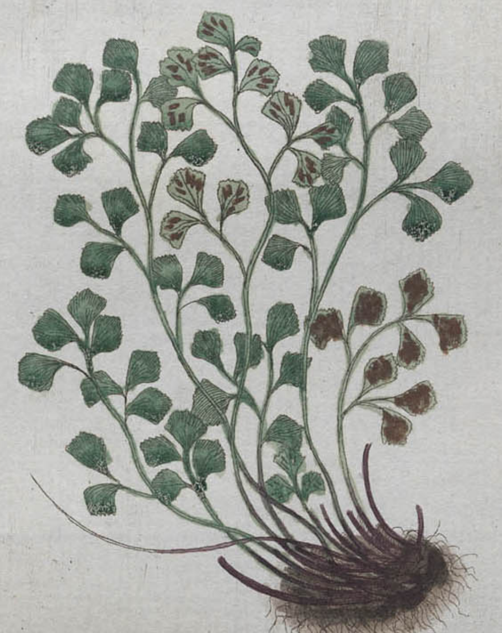
WALLRUE MAIDEN-HAIR.

THE roots are ſmall and hard, furniſhed with ſhort fibres, inſinuating themſelves deeply in the narrow chinks of dry rocks and the walls of old buildings.

Leaves three or four inches high, narrow as a thread, half their length from the root naked, the upper part branched in an irregular alternate order, each branch carrying two or three lobes, of a very dark green above, paler underneath.

Lobes ſhort, broad, with four unequal ſides, adhering to the footſtalk in an acute angle; the two ſides next the baſe entire, the two exterior ſides finely crenated on the edges with numerous ſmall dents.

Tab. 16,



Asplenium ruta-muraria.

Seed veſſels firſt appear in white longiſh dots on the under ſide of the lobes, two or three on each ſide the nerve, placed obliquely; when the ſeeds are ripe the veſſels burſt, enlarge, and joining each other at their margins cover the central part of the diſk, the margins only being uncovered.

There is a variety with ſmall leaves taken notice of by Mr. Ray in 3d ſyn. p. 123.

Wallrue Maiden-Hair grows from the chinks of dry rocks in the North of England, and on the mountains of Wales abundantly; on rocks in the Eves near Heptonſtall; on Sowerby Bridge, two miles from Halifax. The leaves grow firſt horizontally, then curve gradually upwards.

ASPLENIUM adiantum-nigrum.

Sp. Plan. 1541. *Ray Syn.* 126. *Flo. Scot.* 666. *Flo. Ang.* 454.
Ger. Em. 1137. *Park.* 1406.

TAB. XVII.

BLACK MAIDEN HAIR.

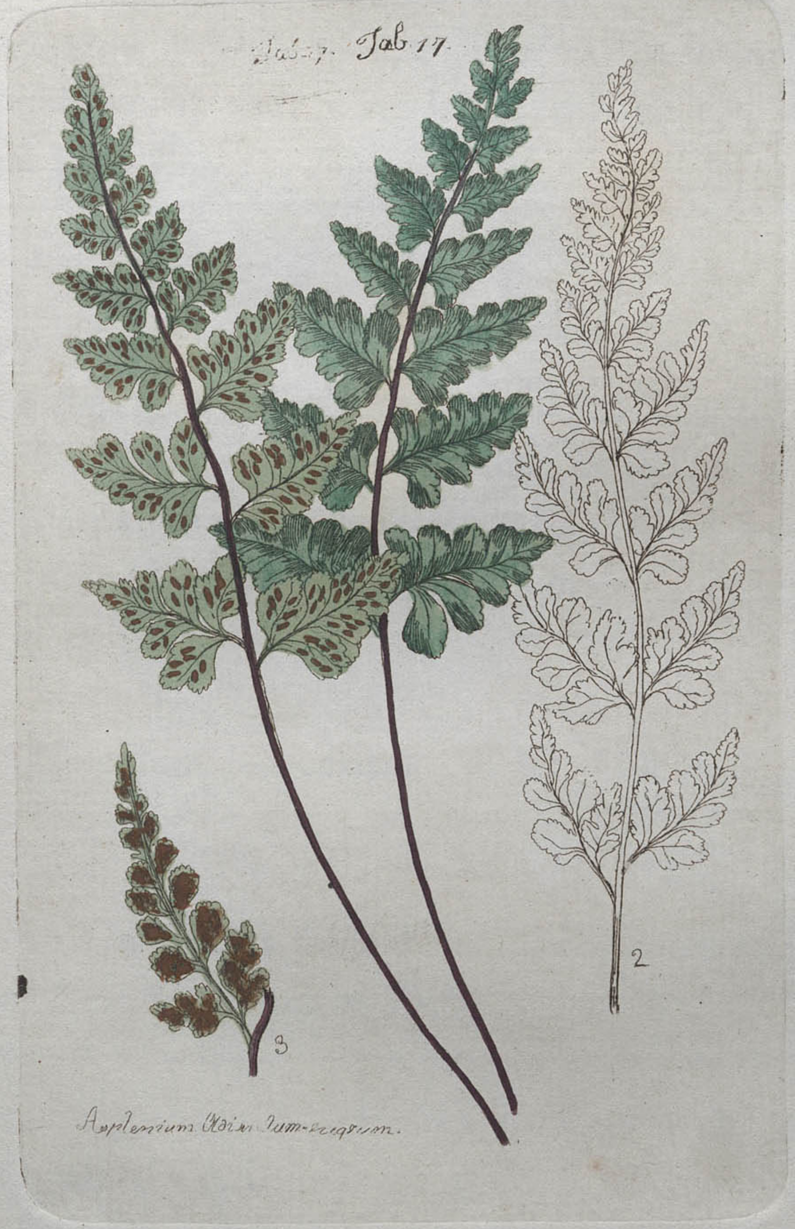
THE roots are long, large, and black, furniſhed with many long fibres, by which it fixes itſelf ſo firmly in the places where it grows that it is with great difficulty dug out.

Firſt leaves from five to ten inches in length; rib black, gloſſy, and naked for half its length from the root; figure of the leaſy part tapering, broadeſt below, diminiſhing gradually to the top.

Second leaves ten or fifteen pairs, oppoſite or alternate, triangular, broad at the baſe, tapering to the point, of a fine bright gloſſy green above, paler underneath.

Lobes from four to ſeven pairs, one or two of the firſt pairs divided down to the nerve of the ſecond leaves; in luxuriant and full-grown ſpecimens theſe lobes are again partly lobed, the other pairs becoming gradually confluent at the top of the ſecond leaves.

The



The firſt lobe on the upper ſide grows erect, and cloſe to the rib of the firſt leaf, on the under ſide it inclines obliquely outwards; all of them entire on the two ſides near the baſe, the reſt finely crenated.

Seed veſſels appear in white oblique lines on the back of the lobes, afterwards become brown, and, when burſt, enlarge and cover the central part of the diſk; *ſee Tab.* 17. *Fig.* 3.

VARIETIES.

I gathered a variety of this plant on an old wall near the village of Wharf in Yorkſhire; leaves not broader below than in the middle, lance-ſhaped; ſecond leaves alternate, remote, tapering; lobes divided down to the middle rib, of a roundiſh figure and deeply crenated at top; *ſee Tab.* 17. *Fig.* 2.

Is this the Aſplenium lanceolatum of Mr. Hudſon? *ſee Flo. Ang.* 2*nd Edit. p.* 454. *No.* 8.

Black Maiden Hair grows from the chinks of rocks and old walls in the Weſt-riding of Yorkſhire, and in Wales.

The ſpecimen figured and deſcribed I gathered on the rock near the the head of the vale of Clyde, in Denbighſhire, where the Lychen ſiliquoſus grows.

POLIPODIUM

POLIPODIUM.

Lin. Gen. Plan. 1179.

POLIPODIUM vulgare.

Sp. Pl. 1544. *Ray Syn.* 117. *Flo. Scot.* 667. *Flo. Ang.* 455.
Ger. Em. 1132. *Park.* 1039.

T A B. XVIII.

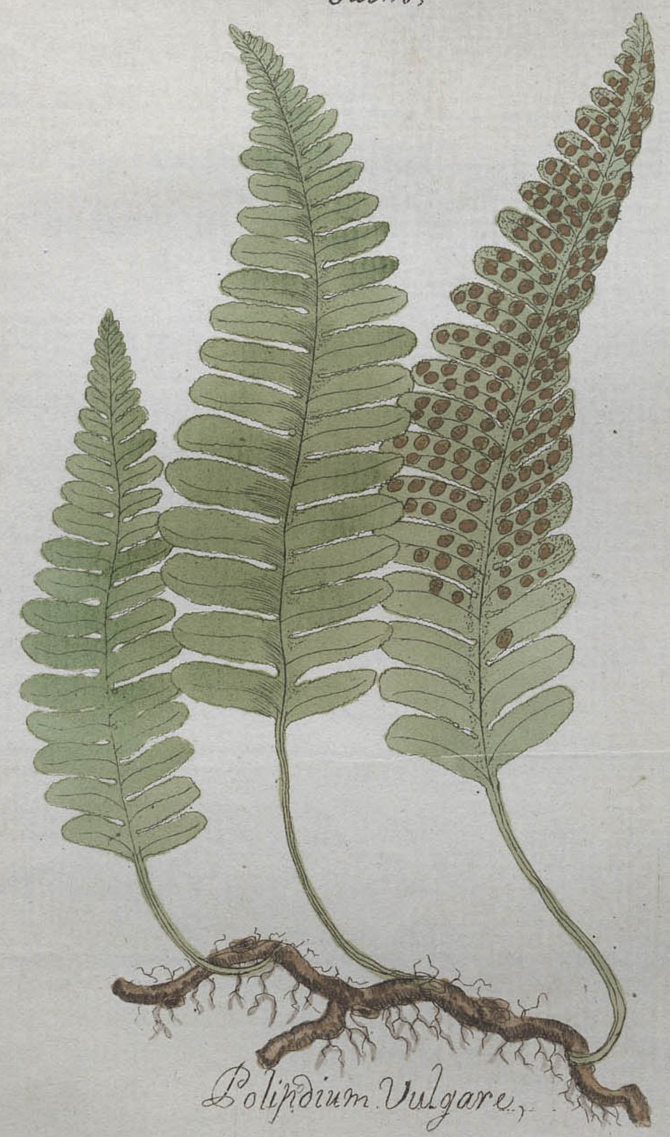
POLIPODY.

THE root is long, crooked, branched, creeping horizontally under the moſs, here and there emitting a few fibres.

The leaves riſe ſingly at ſmall diſtances from four to ten inches high; they are ſimply pinnate, lance-ſhaped, and of a beautiful green, deſtitute of lobes one-third of their length from the root, and of a firm dry ſubſtance.

Lobes fifteen or twenty pairs; a few of the loweſt pairs increaſing gradually upwards, then diminiſhing to the top, where they become confluent, terminating the leaf in an entire point; they are tongue-ſhaped, entire on the edges, and bluntly rounded off at the extremity.

Tab. 18.



Polipdium Vulgare,

Seed veſſels placed in round dots on the back of the lobes, three or four in a row on each ſide the nerve, from a pale green gradually changing to a brown orange colour.

VARIETIES.

The Polipodium cambricum is now known to be a variety of this plant. The general ſhape of its leaves oval; lobes confluent, and decurrent at the baſe, irregularly gaſhed on the edges, the ſegments long, narrow, crouded, ſerrated or crenated on the edges, the whole leaf thin, ſmooth, ſemi-tranſparent, of a pale green and very elegant. *See the figure of a lobe, Tab.* 2. *Fig.* 5. *a.* This variety produces no ſeed veſſels.

There is another remarkable variety in which the lobes are proliferous, having other lobes growing from their ſides; *ſee Tab* 2. *Fig.* 5. *b.* This variety was diſcovered in fructification in a wood near Bingley by Mr. W. Alexander, of Halifax, in Auguſt 1782.

Polipody grows on old moſſy walls, rocks, and about the roots of old trees in ſhady places.

POLIPODIUM lonchitis.

Sp. Pl. 1548. *Ray Syn.* 118. *Flo. Scot.* 668. *Flo. Ang.* 456.
Ger. Em. 1140. *Park.* 1042.

T A B. XIX.

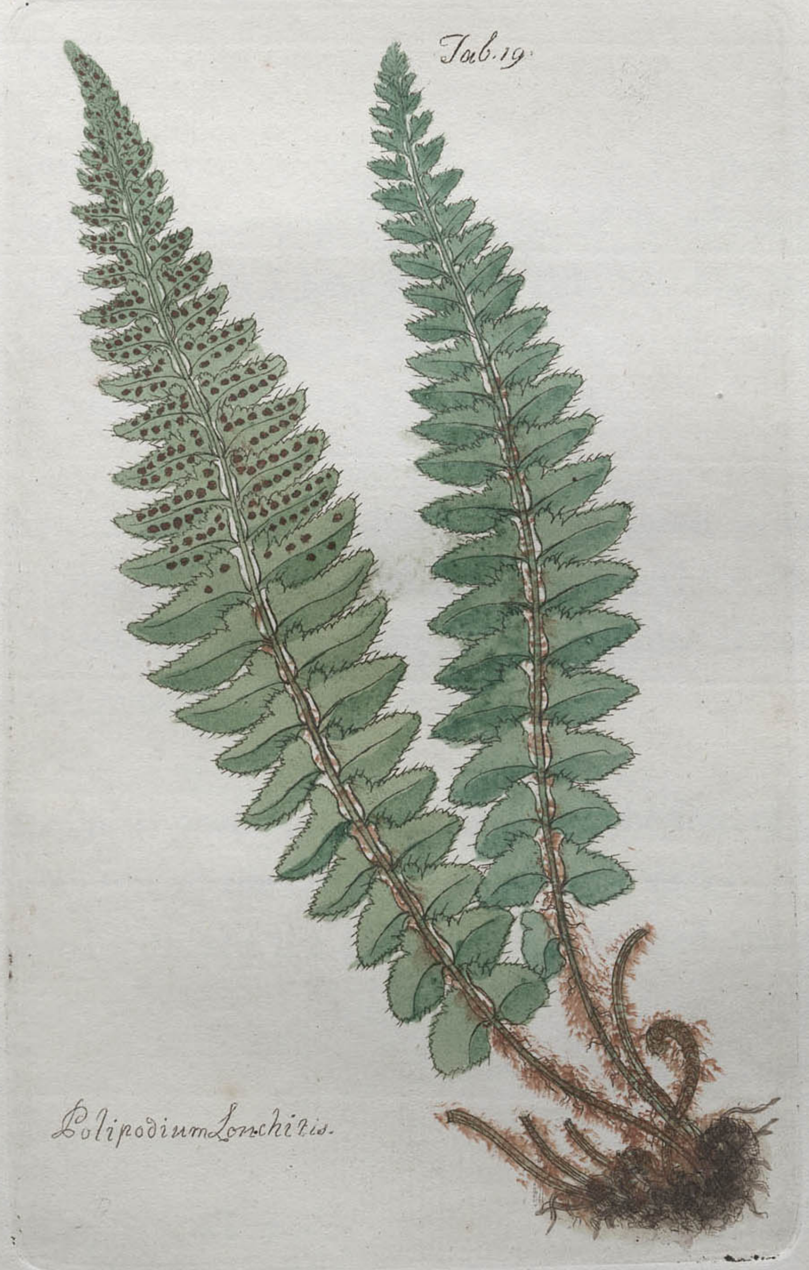
GREAT SPLEENWORT.

THE roots are thick, hard, compact and woody, covered with brown ſcales, very fibrous, and have many ſtumps of decayed leaves remaining upon them.

Leaves from five to ten inches long, ſimply pinnate, perfectly lance-ſhaped, and of a bright and beautiful green; their ſubſtance hard and dry; the rib covered with chaffy ſcales of a pale brown.

Lobes from fifteen to twenty-five pairs, placed alternately, the loweſt pairs ſhort, remote, the reſt growing gradually nearer to the top; they are of an irregular lunated figure, having an ear-like proceſs on the upper edge near the baſe, the lower edge obliquely cut off at the baſe; the body of the lobe curving upwards, the baſe both above and below the nerve entire, the reſt doubly ſerrated, the larger ſerratures terminating in ſharp ſpines.

Seed


Tab. 19.
Polipodium Lonchitis.

Seed veſſels placed in round dots on the plane diſk of the lobes on the under ſide, eight or ten in a row on each ſide the nerve, white at firſt, of a yellowiſh brown colour when ripe, the lobes on the lower half of the leaf generally barren.

Polipodium lonchitis very greatly reſembles the Polipodium aculeatum in ſome of its ſtates, particularly that variety of it which Hudſon calls Polipodium lobatum, which I have figured Tab. 26. Fig. 2. Theſe two plants in figure, colour, ſubſtance, manner of growth and general habit, bear a reſemblance too ſtriking to be diſregarded.

The Polipodium aculeatum and lobatum are found growing on moiſt rocks and ſhady places. Polipodium lonchitis on the cold mountains of North Wales. Is it poſſible that Polipodium lonchitis ſhould be a ſtarved variety of Polipodium aculeatum?

Polipodium lonchitis grows on Snowdon; near the foot of *Crib y Deſtilh*, iſſuing from the chinks of the rocks; alſo on the rocks of *Glydar*, near Llanberris, where I gathered the ſpecimen here figured and deſcribed.

POLIPODIUM phegopteris.

Sp. Pl. 1550. *Ray Syn.* 122. *Flo. Scot.* 669. *Flo. Ang.* 456.

TAB. XX.

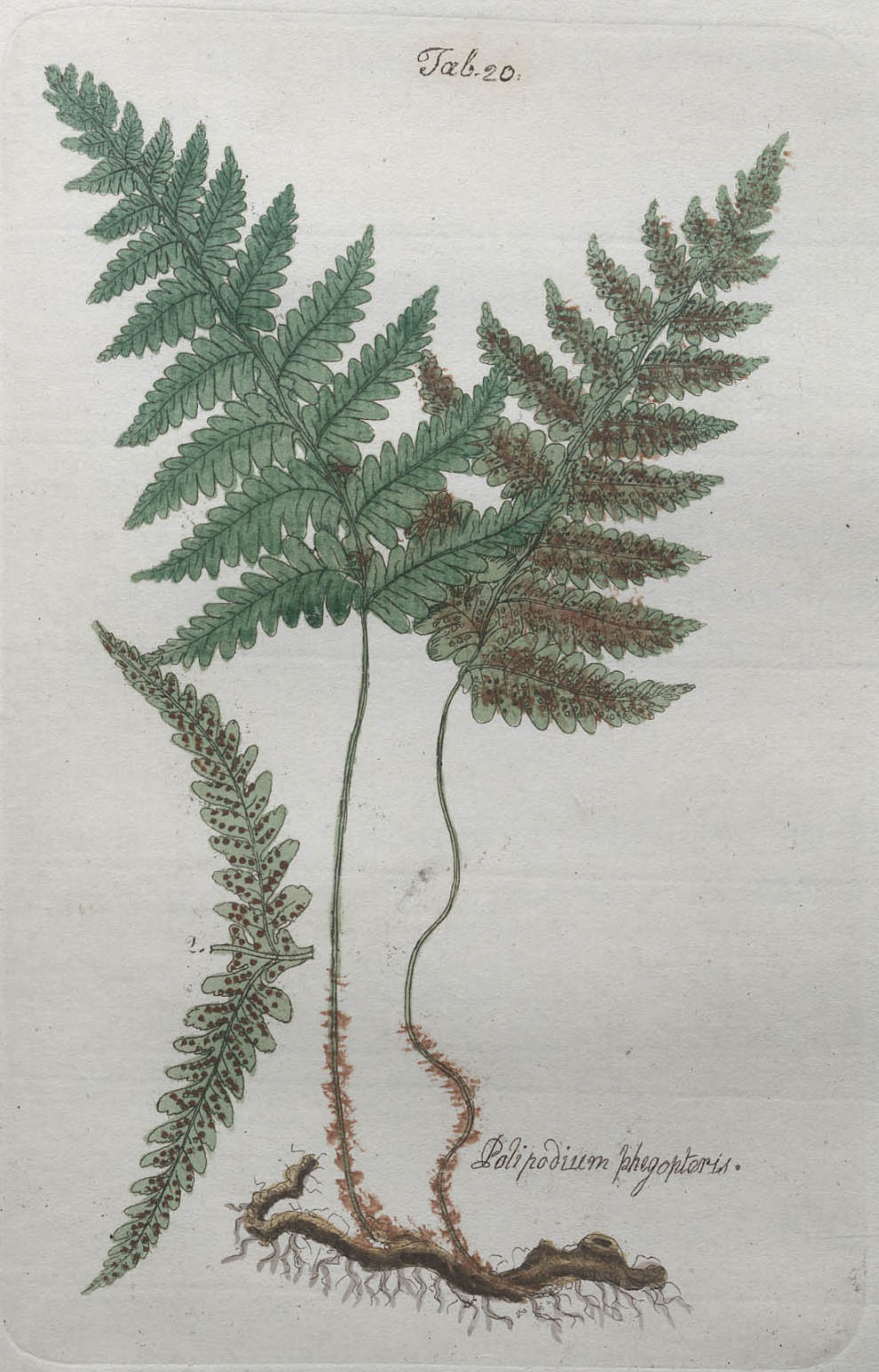
WOOD POLIPODY.

THE roots are long, crooked, branched, and creep under the moſs in the moiſt part of dark and ſhadowy woods, emitting a few fibres into the crumbly mould as they creep along.

Firſt leaves from ſix to twelve inches high; rib a little chaffy, naked more than half its length from the root; general outline of the leaf triangular, tapering from the baſe to the point; colour a dark fuſcous green; rib ſlender, round, pellucid.

Second leaves eight or ten pairs, ſometimes oppoſite, loweſt pair the largeſt, thence diminiſhing to the top.

Lobes ten or twelve pairs; the loweſt pair ſhorteſt, united on its outer edge to the next lobe, on its inner to the rib of the firſt leaf, and is decurrent;


Tab. 20.
Polipodium phegopteris.

rent; *ſee Tab.* 20. *Fig.* 2. The other lobes diſtinct for three or four of the firſt pairs, near the extremity become confluent, terminating the ſecond leaf in a crenated point. The lobes on one or two of the largeſt ſecond leaves are irregularly crenated; loweſt pair of the ſecond leaves wants the ſhort decurrent lobe at the baſe.

Seed veſſels in ſmall dots on the margins of the lobes near their diviſions, two, three, or four on each ſide, at firſt white, afterwards of a pale brown, laſtly black.

Wood Polipody grows in the moiſt part of ſhadowy woods, in the Weſt Riding of Yorkſhire in many places; in a little wood in Soyland, juſt by the brook below Kebroyd-Mill plentifully; and in a little ſhadowy range of wood ground near the brook above Oldhouſe-Mill, Norland, two miles from Halifax.

The whole plant is of a dark fuſcous green; whilſt young a little downy, and feels ſoft to the touch; to the lower part of the rib adhere a few chaffy pale brown ſcales.

POLIPODIUM fontanum.

Sp. Plan. 1550. *Flo. Ang.* 456.

TAB. XXI.

FOUNTAIN POLIPODY.

THE firſt leaves three or four inches long, lance-ſhaped, narrow at the top; rib ſmooth, naked about an inch from the root, and of a pale green colour, of an hard and dry ſubſtance.

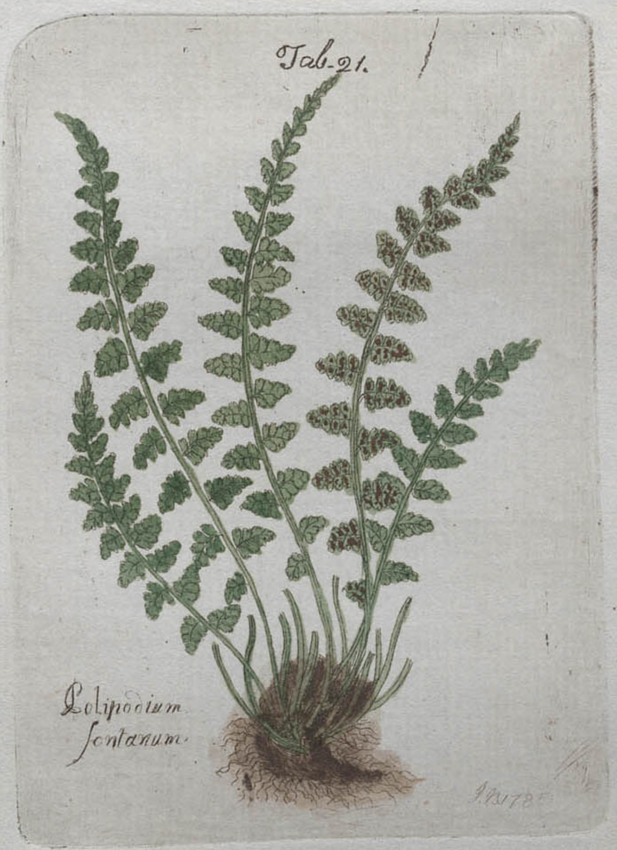
Second leaves twelve or fifteen pairs, alternate, of an oval figure, broad at the baſe, and bluntly pointed.

Lobes three or four pairs, oppoſite, divided down to the nerve, of a roundiſh figure, and crenated with three or four dents, flowing together at the extremity of the ſecond leaf.

Seed veſſels make their firſt appearance in ſmall dots on the back of the lobes; when they burſt, they flow together and overſpread the whole diſk. Dr. Hill, in his Flora Britannica, page 530, tab. 3, gives a bad figure of this plant for the Acroſtichum Ilvenſe.

Fountain

Tab. 21.



Fountain Polipody is ſaid to grow on old walls and rocks above Hamerſham church; in ſtony places near Waybourn in Weſtmorland. The Specimen here figured and deſcribed was ſent to my brother, A.D. 1775, by a gentleman who gathered it in Buckinghamſhire, and miſtook it for the Acroſtichum ilvenſe.

POLIPODIUM

POLIPODIUM thelypteris.

Flo. Ang. 457. *Flo. Scot.* 674. *Ray Syn.* 122. *Ger. Em.* 1135.
Park. 1041.

T A B. XXII.

MARSH POLIPODY.

THE roots are long, large, and furniſhed with innumerable long fibres, which ſpread under the ſurface, and take faſt hold of the mire in which it grows.

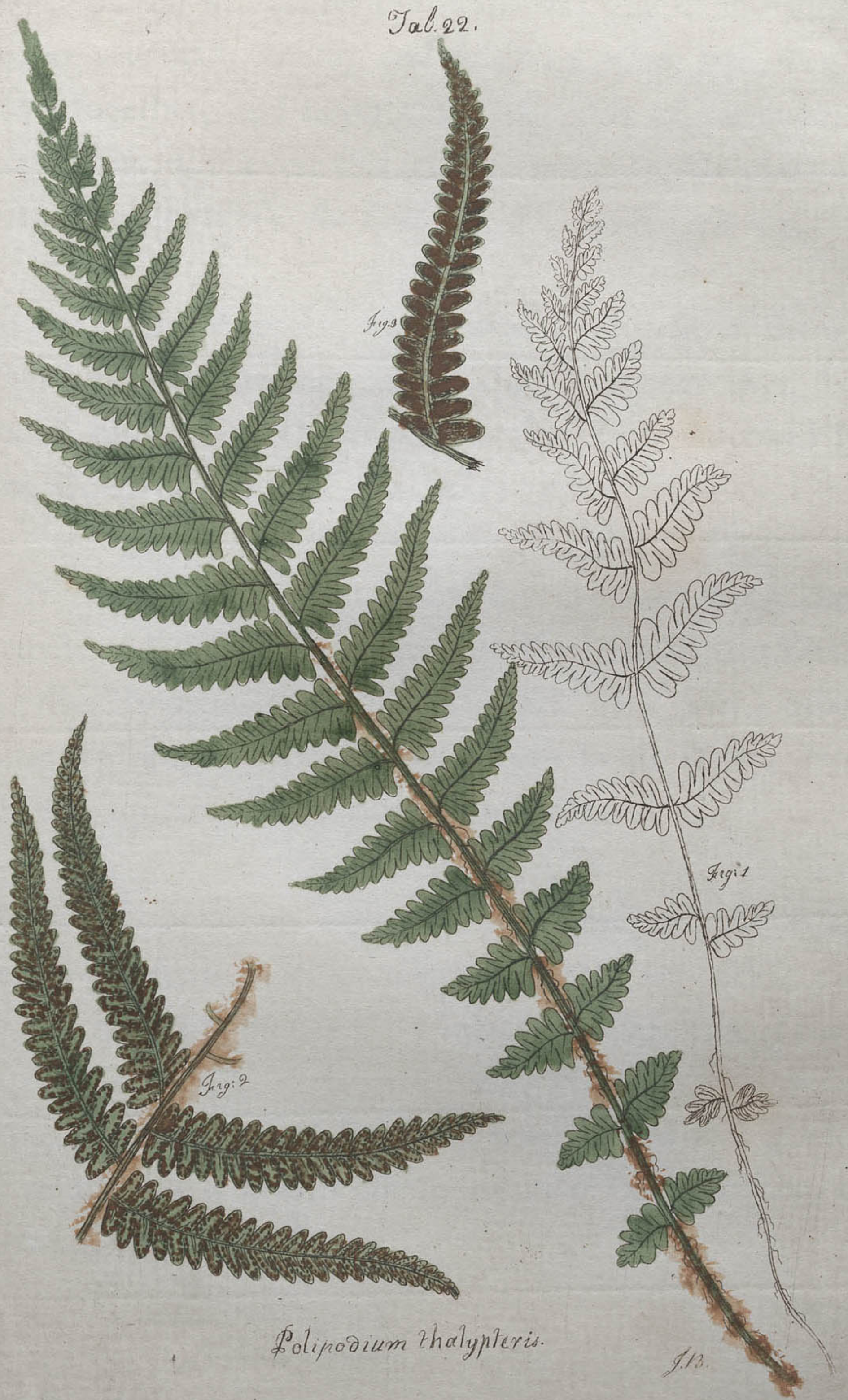
Firſt leaves from one to two feet in length, lance-ſhaped, broadeſt in the middle, thence gradually decreaſing upwards, and terminating in an acute point.

Second leaves from fifteen to thirty pairs, oppoſite or alternate, below more remote, upwards growing gradually nearer each other, and, near the top, running together at their baſe.

Lobes about fifteen pairs, not divided quite down to the nerve, of an oblong figure, broadeſt at the baſe, ending in an obtuſe point, and entire on the edges, loweſt pair the largeſt, thence diminiſhing to the top, where they become confluent, and loſe themſelves in the acute termination of the ſecond leaf.

Seed

Tab. 22.



Polipodium thalypteris.

Seed veſſels placed in dots on the under margin of the lobes, tab. fig. 2d; at firſt of a whitiſh colour, and diſtinct; when ripe, they burſt, turn brown, flow together, and cover the whole diſk of the lobe, except the middle nerve, fig. 3. From this laſt circumſtance, the plant was formerly taken for an Acroſtichum; *ſee Lin. Sp. Pl.* 1528. *No.* 25.

The young roots are barren, the leaves ariſing from them are ſix or eight inches high, all the parts fewer, their ſubſtance thin, light, tender and delicate, fig. 1. In this ſtate it is accurately deſcribed by the ingenious John Goodyer; *ſee Ger. Em. p.* 1135.

Marſh Polipody grows in moiſt marſhy grounds about the borders of moors, woods and rivulets. It grows at the bottom of a little wood near the rivulet directly below the cottages in Birks-lane, half a mile from Halifax; in the top of a four field under North Dean Wood, Norland; and about Cob Clough near Ripponden plentifully.

I ſuſpect the Polipodium fragrans of Mr. Hudſon to be a variety of this plant, where the ſeeds, accidentally taking root on rocks, produce ſmall plants having the parts crouded. Linnæus's deſcription of the Polipodium fragrans, *ſee Mantiſſa*, 2, 307, agrees with Polipodium thelypteris in every thing but magnitude. If Polipodium fragrans is a real ſpecies, I ſhall be thankful to any one who will communicate a fair ſpecimen, or give hints of information concerning it.

POLIPODIUM criſtatum.

Sp. Pl. 1551. *Ray Syn.* 124. *Flo. Scot.* 670. *Flo. Ang.* 457.
Ger. Em. 1129.

T A B. XXIII.

CRESTED POLIPODY.

THE root is a ſhort mis-ſhapen lump, furniſhed with a multitude of long, brown, divided, and ſubdivided fibres.

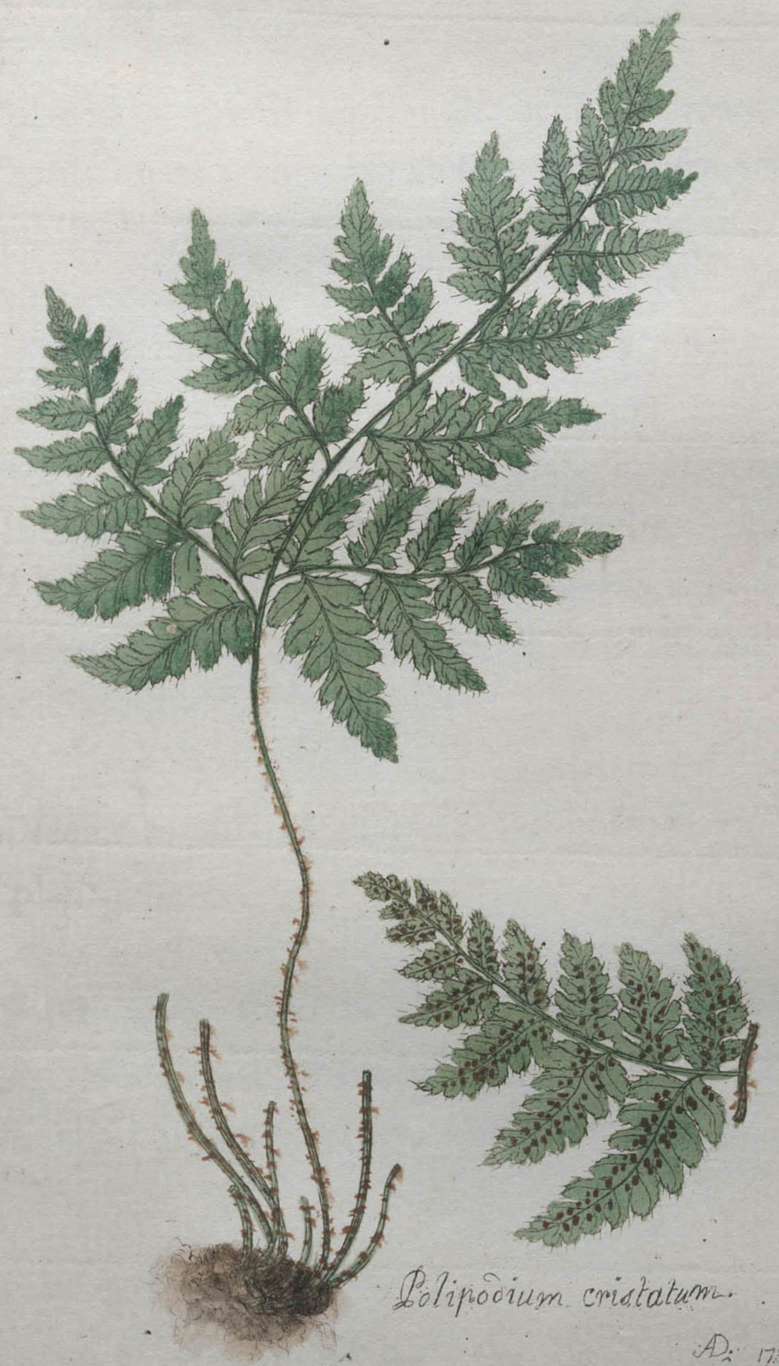
Firſt leaves from ſix to thirty inches high; the rib thinly covered with brown chaffy films, deſtitute of leaf for more than half its length; general figure of the leaf triangular, tapering upwards to a point.

Second leaves from nine to fifteen or twenty pairs, placed oppoſite or alternate; of a triangular figure tapering to the extremity.

Third leaves from ſeven to fifteen pairs, of an oblong ſhape, but tapering to a point; thoſe which grow on the lower ſide of the rib of the ſecond leaf larger than thoſe which grow on the upper.

Lobes.

Tab. 23.



Polipodium cristatum.

AD: 1785.

Lobes nine or ten pairs, of an oval ſhape, deflected, loweſt pairs largeſt, divided down to the nerve; the others gradually run together at the extremity, and loſe themſelves in the point of the third leaf, all of them ſerrated and ſpiny on the edges.

Seed veſſels placed in round dots in the back of the lobes, two or three on each near the diviſions; they are at firſt white, afterwards brown, and at laſt turn blackiſh.

VARIETIES.

There are two varieties of this plant; one, in which the loweſt pair only of ſecond leaves are ſo ſubdivided as to produce third leaves having diſtinct divided lobes. From a ſpecimen of this kind my figure was taken. In the other variety, ſeveral of the lower pairs of ſecond leaves are thus ſubdivided.

Mr. Hudſon ſeems to ſuſpect that the Polipodium rheticum is a ſmall variety of this plant.

Creſted Polipody grows from the chinks of moiſt rocks and old walls in ſteep and craggy woods every where in the pariſh of Halifax; particularly in Birks Wood, and Lee Bank ſhrogs, abundantly.

POLIPODIUM Filix-mas.

Lin. Sp. Pl. 1551. *Ray Syn.* 120. *Flo. Scot.* 671. *Flo. Ang.* 458.
Ger. Em. 1130. *Park.* 1036.

TAB. XXIV.

MALE FERN.

THE root is large, long, firm, and woody, ſurrounded on the outſide with thick brown ſcales in an imbricated order, and furniſhed with many long black tough fibres.

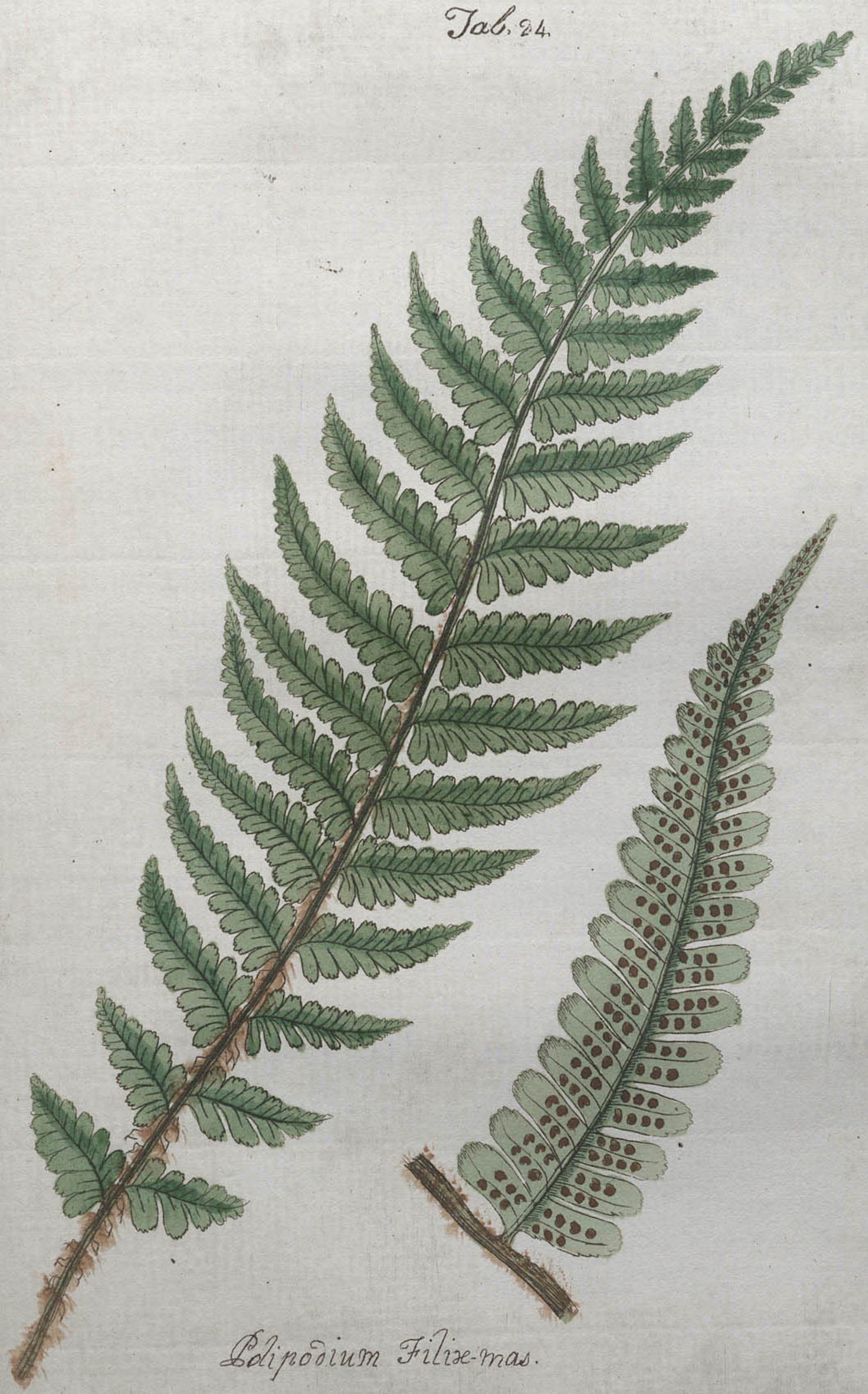
The firſt leaves from one to four feet in length; when young, the rib is thickly covered with brown tough tranſparent ſcales of an oblique oval lance-ſhape; the general figure of the leaf is lance-ſhaped, broadeſt in the middle, and thence gradually decreaſing to each extremity, and terminating above in an acute point.

Second leaves from fifteen to forty pairs, remote on the lower part, growing gradually nearer upwards, and running together at the top.

Lobes from ſeven to fifteen pairs, the loweſt pair largeſt, decreaſing upwards till they run together and loſe themſelves in the point of the ſecond

leaf,

Tab. 24.



Polipodium Filix-mas.

leaf, their ſhape oblong, rather broader at the baſe, blunt at the extremity, and more or leſs ſerrated or crenated on the edge, particularly at the upper extremity.

Seed veſſels in two rows placed on the back of the lobes on the plane of the diſk, one row on each ſide the nerve, in number from three to ſix, kidney-ſhaped, covered with a pellicle; they are at firſt white, then change to a bluiſh or aſh colour; when the ſeeds are ripe the pellicle burſts, and, after the diſcharge of the ſeeds, the veſſels become brown, and appear as if covered with duſt, but do not run together as in the Polipodium thelypteris.

The certain characters of diſtinction between Polipodium Filix-mas, and Polipodium thelypteris, are theſe: in the firſt, the lobes are broad at the extremity, and ſerrated; the ſeed-veſſels are kidney-ſhaped, and placed on the plane diſk of the lobes; in the laſt the lobes are obtuſely pointed, and entire on the edges; and the ſeed veſſels placed in rows of ſmall round dots cloſe to the margin of the lobes.

Male Fern grows about the borders of woods near rivulets, and in ſtony and rocky places about Halifax abundantly.

POLIPODIUM

POLIPODIUM Filix-femina.

Sp. Pl. 1552. *Ray Syn.* 121. *Flo. Scot.* 673. *Flo. Ang.* 458.
Ger. Em. 1130. *No.* 3.

TAB. XXV.

FEMALE FERN.

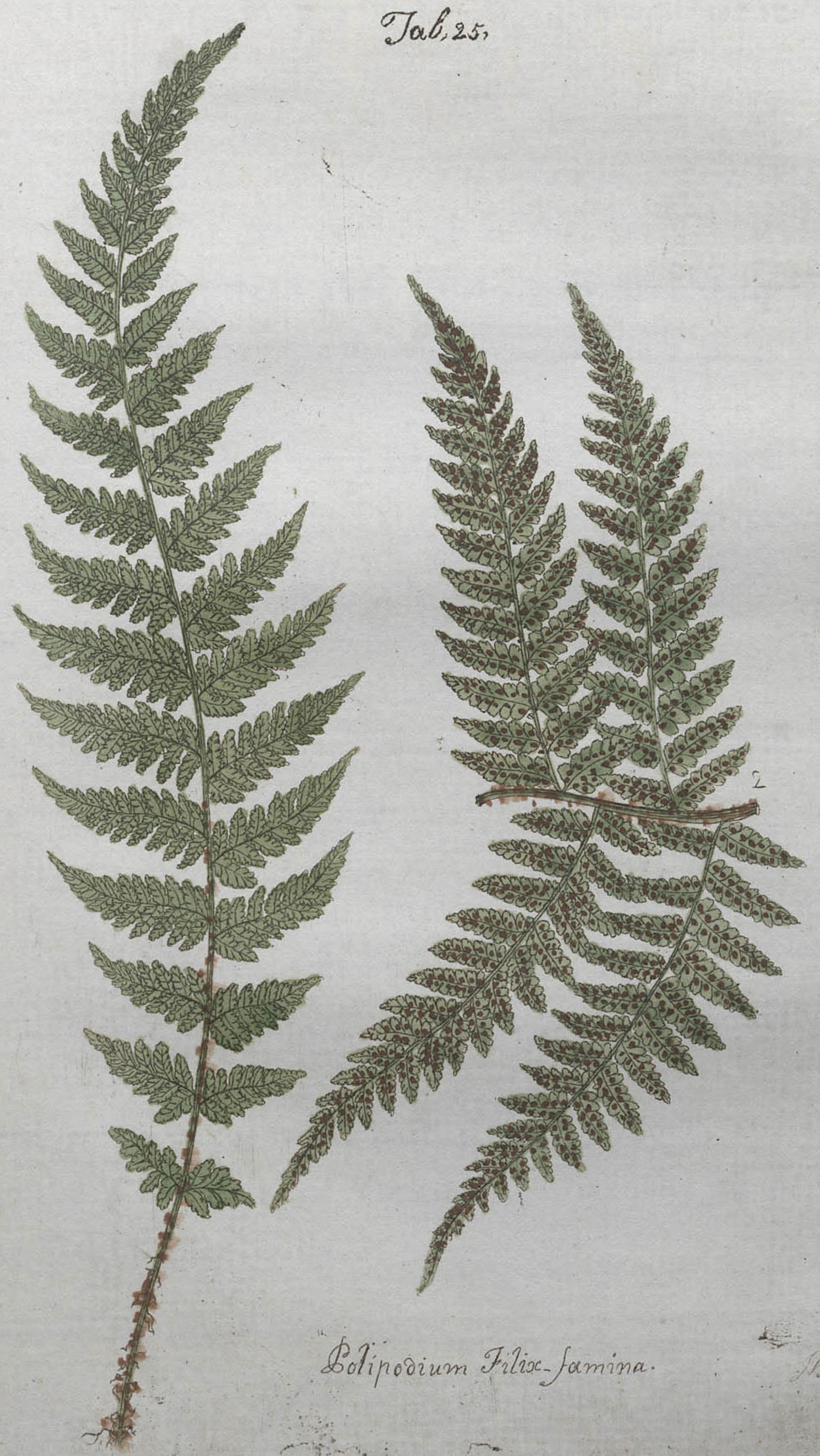
THE roots are large, hard, and woody, covered with brown tough ſcales, very fibrous, and taking firm hold in the ground.

The firſt leaves from one to four feet high; the rib ſmooth, furrowed on the upper ſide, round or gibbous on the under, gently waved near the top for the inſertion of the ſecond leaves, while young a few chaffy brown ſcales on the lower part; the general outline of the leaf lance-ſhaped, broad in the middle, acutely pointed above.

Second leaves from fifteen to forty pairs, broadeſt at the baſe, thence gradually diminiſhing and terminating in a fine extended point; pairs placed more remote below, the firſt three inches from the next, coming nearer each other gradually upwards; near the top the triple diviſion ceaſes, the third leaves are loſt in the ſecond, and the ſecond in lobes which terminate the whole in a fine feathered point.

Third

Tab. 25.



Polipodium Filix-famina.

Third leaves from twenty to thirty-five pairs, placed nearly oppoſite, loweſt pair largeſt, diminiſhing upwards till they are loſt in the termination of the ſecond leaves.

Lobes ten or twelve pairs, oppoſite, a few of the firſt pairs divided down to the nerve, confluent at the point, where they are loſt in the blunt crenated termination of the third leaf; they are of an oblong figure, blunt at the extremity, where they are deeply crenated with three or four dents.

The number of theſe lobes, on a large and well-grown leaf, I have found to exceed five and thirty thouſand; the whole of a fine green; the ſubſtance light, tender and very delicate, and in point of beauty and elegance much ſuperior to any other of the Britiſh ferns.

Seed veſſels in round dots, one on each lobe near the diviſion at its baſe, at firſt white, afterwards green, and at laſt brown.

My figure is reduced by a ſcale of twenty-four ſuppoſed inches, on ſix inches of the ſtandard foot. The branch, with ſeed veſſels, is taken from a ſmall, or middle-ſized ſpecimen, and, drawn of its natural bigneſs.

Female Fern grows in the moiſt part of rocky woods, and about brooks and rivulets in the Weſt-riding of Yorkſhire. In rocky moiſt places beſide Lee Beck near Halifax plentifully.

POLIPODIUM

POLIPODIUM aculeatum.

Lin. Sp. Plan. 1552. *Ray Syn.* 121. *Flo. Scot.* 675. *Flo. Ang.* 459.
Ger. Em. 1130.

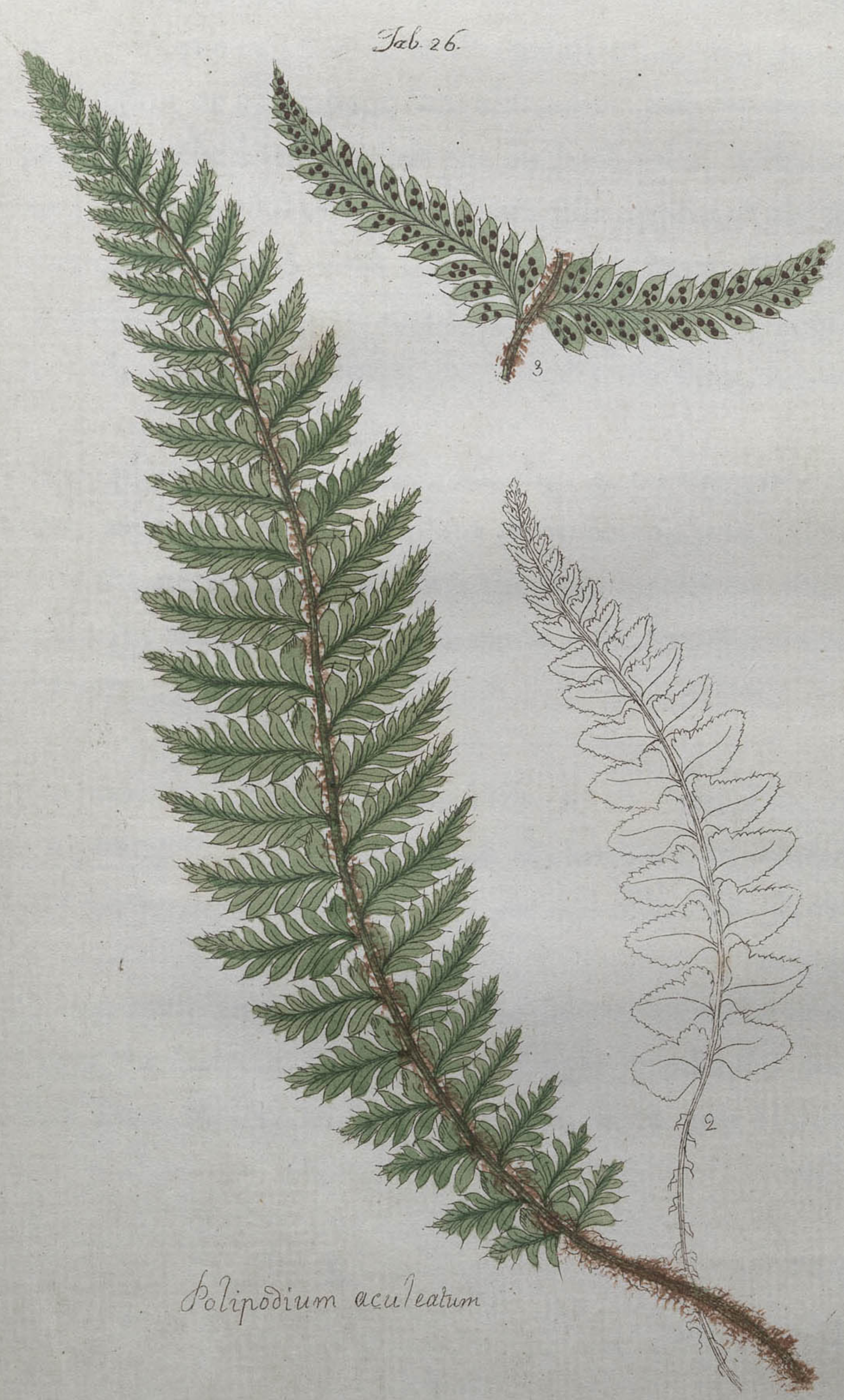
TAB. XXVI.

PRICKLY POLIPODY.

FIRST leaves from one to two feet in length, of a true lance-ſhape, broadeſt in the middle, decreaſing gradually and ſlowly toward the extremities, being ſomewhat broader at bottom than at top; the rib channeled on the upper ſide, round below, and cloſely covered with brown chaffy filmy ſcales; ſubſtance hard, rigid, dry; colour a dark green.

Second leaves from twenty to forty in number, one or two of the loweſt pairs placed oppoſite, becoming gradually alternate upwards, ſeparate from each other quite to the top, the loweſt pair a little more remote than the next above, by an eaſy gradation growing nearer and nearer to the top, all placed at an acute angle with the middle rib, and curving upwards from the baſe to the point.

Lobes from eight to twenty, a few of the firſt pairs divided down to the nerve, they thence gradually become confluent, and loſe themſelves in the acute



Polipodium aculeatum

acute prickly termination of the ſecond leaf; firſt lobe on the upper ſide largeſt, of an oblique ear-ſhape, erect, terminating in a ſharp ſpine, has a kind of projection or appendage on the outer ſide in the broadeſt part, which, as well as the little projections on both ſides, terminates in a ſmall ſharp ſpine; the other lobes on the upper ſide approach to this in ſhape, but are ſmaller, ſpiny and erect; lobes on the lower ſide obliquely ear-ſhaped, grow in an horizontal direction, making a very acute angle with the nerve, and, like thoſe above, are armed with ſharp ſpines.

Seed veſſels placed in rows, *Tab.* 26. *Fig.* 3. on the plane diſk of the ſecond leaves; near the top of the plant there are only two regular rows one on each ſide the nerve; lower down they are placed on the lobes, ſomewhat irregularly, from one to five on each, (*ſee Fig.* 3.) lower half of the firſt leaf barren.

The Polipodium lobatum, Hall. Hiſt. 1712, and Flo. Ang. 459, is doubtleſs a young plant of Polipodium aculeatum; of this I am certain from obſervation, *ſee Tab.* 26. *Fig.* 2. *ſee alſo Flo. Scot. p.* 676.

Polipodium aculeatum grows from the fiſſures of rocks in damp places; on rocks near the bottom of Benroyd Clough, Norland; and in a little wood called Toad-Holes, in Sowerby Dean, both near Halifax.

POLIPODIUM fragile.

Sp. Plan. 1553. *Ray Syn.* 125. *Flo. Scot.* 677. *Park.* 1043.

TAB. XXVII.

BRITTLE POLIPODY.

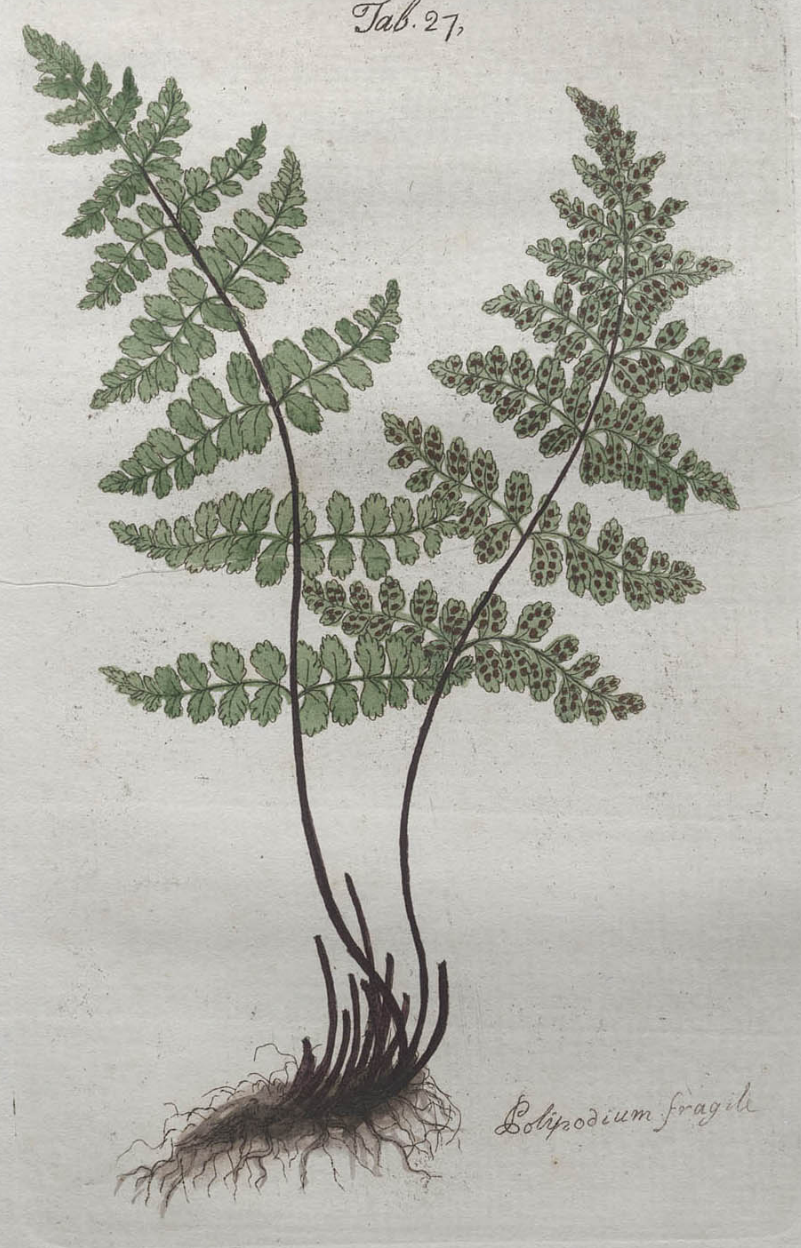
THE body of the root conſiſts of the ſtumps of old leaves which remain undecayed for a conſiderable time in the ground; they are covered with brown ſcales, and furniſhed with many fibres below, taking firm hold in the place where it grows.

The firſt leaves from five to nine inches high; the rib ſmooth, ſlender, and brittle, at firſt of a pale green colour, when old of a purpliſh brown, and gloſſy, naked for about one-third part of their length from the ground; outline of the firſt leaf lance-ſhaped, broader at the baſe, narrow at the point.

Second leaves eight or ten pairs placed oppoſite, remote, broadeſt at the baſe, gradually diminiſhing in breadth to the extremity, and drawing nearer and nearer each other to the top of the firſt leaf.

Lobes

Tab. 27,



Lobes ſix or ſeven pairs, placed oppoſite, diſtant from one another below, growing nearer each other to the top of the ſecond leaf, where they run together in the point of it; their figure is oval, and they are crenated round the edge with eight or ten diſtinct dents.

The dots of ſeed veſſels are placed on the under diſk of the lobes, two or three in a row on each ſide of the nerve, at firſt white, at laſt brown, and, when burſt, run together, and cover the diſk of the lobes, except the margin only.

VARIETIES.

I have ſeen a variety of this plant, growing in moiſt and very ſhady ſituations, as in the deep fiſſures of moiſt rocks where the ſun was excluded, or where it was over grown and ſhadowed with other plants, wherein the leaves were more tall and ſlender than the above deſcribed; the rib of a pale green, the ſecond leaves more remote, the lobes narrower, and the whole plant more light, tranſparent, and delicate; this is undoubtedly the Polipodium Rheticum of Linnæus, *ſee Flo. Scot.* 679, *and my Fig. Tab.* 2. *Fig.* 6.

Brittle Polipody grows from the fiſſures of rocks about Ingleton and Settle, in Yorkſhire; about Caſtleton and other places in the high Peak, Derbyſhire; on Snowdon in Caernarvonſhire, North Wales, abundantly.

POLIPODIUM dryopteris.

Sp. Pl. 1555. *Ray Syn.* 125. *Flo. Scot.* 678. *Flo. Ang.* 640.
Ger. Em. 1135. *Park.* 1043.

TAB. XXVIII.

BRANCHED POLIPODY.

THE roots are long, crooked, knotty, and creep under the moſs, emitting ſlender fibres as they creep along.

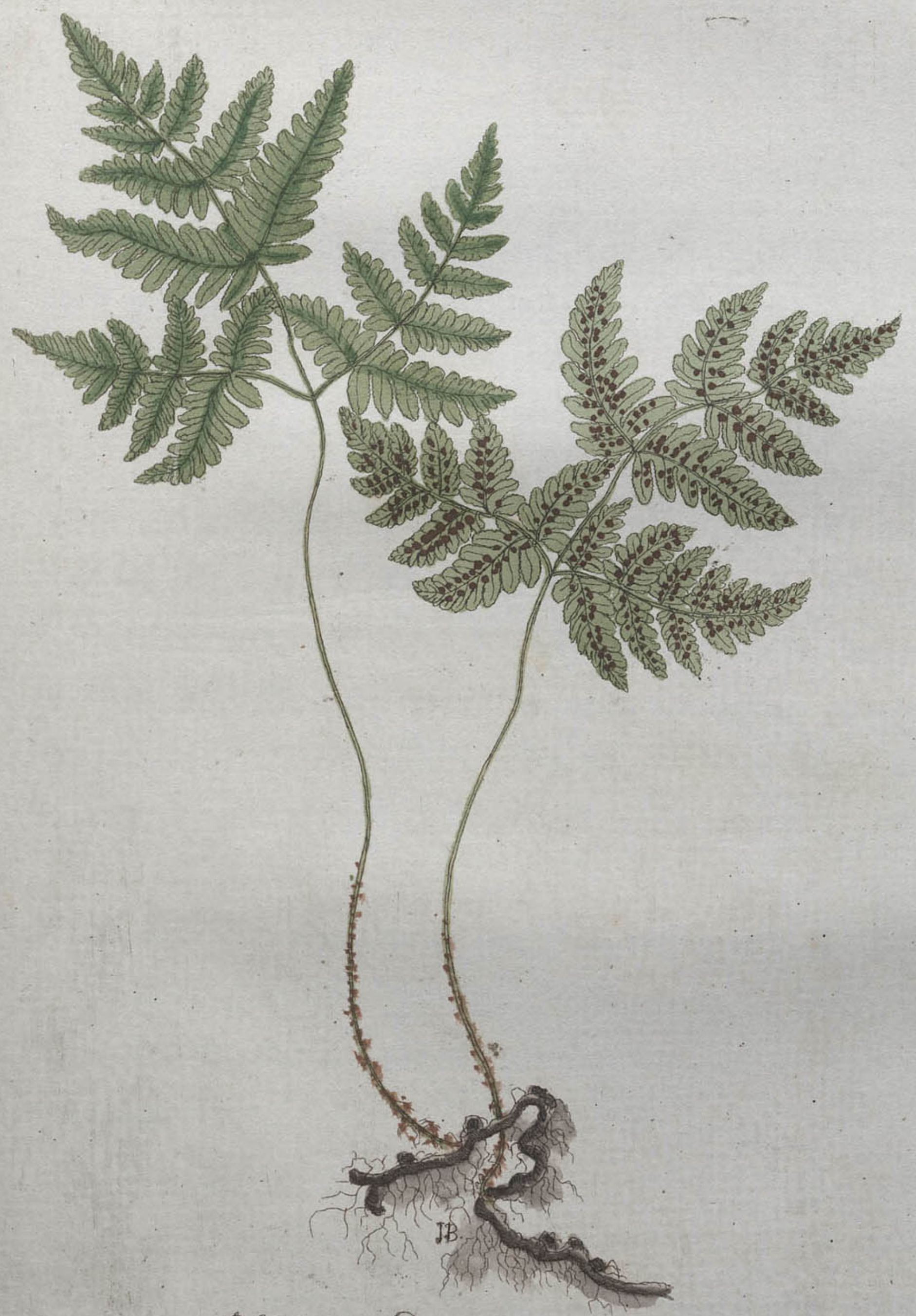
The firſt leaves riſe ſingly at diſtances from the root; the rib round, ſlender, dark green, and ſemi-tranſparent, naked about three-fourths of its length from the root, and about eight inches high; the general figure of the leaf triangular.

Second leaves eight or nine pairs, the loweſt pair twice divided, ſo as to produce third leaves, the other pairs ſimply pinnated, placed oppoſite at the baſe where they are broadeſt, and terminate gradually in a point.

Third leaves ſix or ſeven pairs, placed oppoſite, broadeſt at the baſe, pointed at the top, larger on the lower ſide of the nerve of the ſecond leaf.

Lobes

Tab. 28.



Polipodium Dryopteris

Lobes ſeven or eight pairs, oblong, broadeſt at the baſe, bluntly pointed, and crenated on the edges, running together towards the extremity of the ſecond leaves.

Seed veſſels in round dots placed near the baſe of the lobes on the under ſide, one or two on each lobe, white at firſt, at laſt brown and duſty.

The whole plant of a thin light and delicate ſubſtance; of a beautiful bright yellow green, while young, and very elegant.

VARIETIES.

I have obſerved a variety of this plant, growing in White-ſcars near Ingleton; and in the Peak of Derbyſhire, wherein the rib is taller, more firm, hard, and robuſt, white, and opaque; the leaves larger, the number of parts greater, and the largeſt of the lobes are again partly lobed or divided down half way to the middle rib: this variety I have figured *Tab.* I. *Fig.* I.

Polipodium dryopteris grows in the ſhadowy parts of woods, in a crumbly and moiſt ſoil, amongſt hypnums. It grows in Birks-Wood, North-Dean-Wood, Puttin-Park, and other woods in the neighbourhood of Halifax, plentifully.

ADIANTUM

ADIANTUM. Lin. Gen. Pl. 1180.

ADIANTUM Capillus-veneris.

Sp. Pl. 1559. *Ray Syn.* 123. *Flo. Scot.* 679. *Flo. Ang.* 460.
Ger. Em. 1143. *Park.* 1049.

TAB. XXIX.

TRUE MAIDEN-HAIR.

THE root is ſhort, ſimple, and furniſhed with many black fibres.

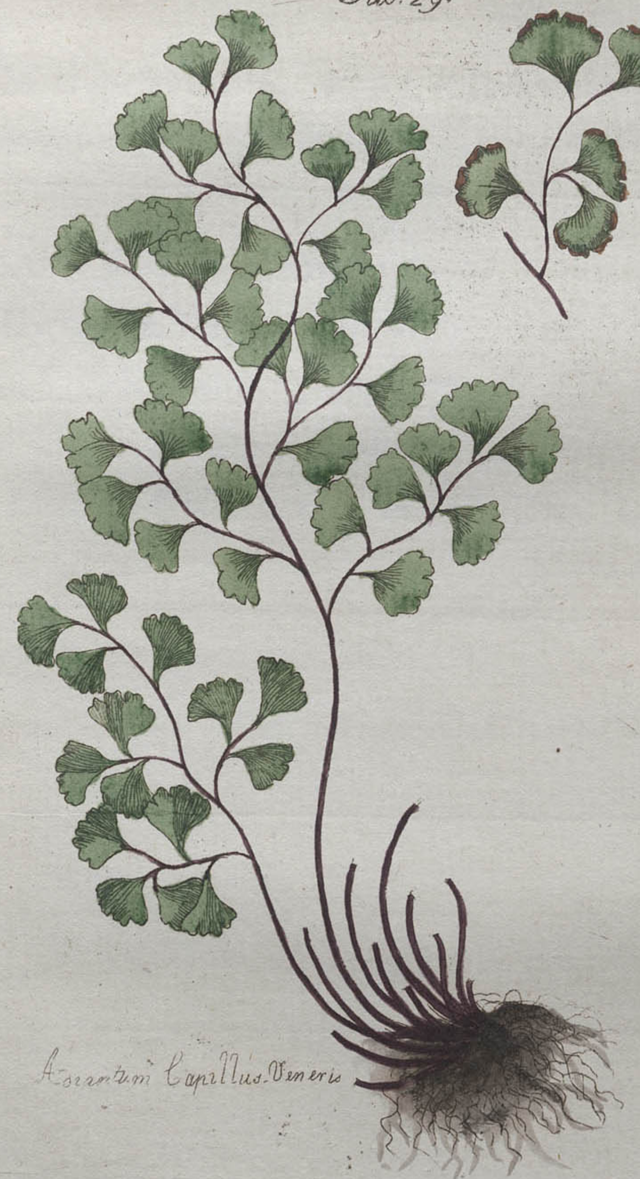
Firſt leaves five or ſix inches high; rib of a black purple colour, ſlender, very bright and gloſſy, naked almoſt half its length from the root; general outline of the leaf approaching to an oval.

Second leaves about three on each ſide, in an unequal alternate order, an inch and half long, compoſed of ſix or ſeven lobes, generally ſupported on ſingle ſhort filiform footſtalks; ſometimes theſe footſtalks are again divided and ſupport two lobes.

Lobes fan-ſhaped, narrow at the baſe, entire on the outer edges, broad and rounded at the extremity, where they are divided into four or five lobes or ſegments, which are of a membranaceous ſubſtance and turn backwards.

Seed

Tab. 29.



Adiantum Capillus Veneris

Seed veſſels placed in lines or oblong ſpots on the upper margin of the lobe, and covered by the thin ſegments which are bent back upon them; at firſt of a white colour, covered with a membrane which burſts when ripe, after which the veſſels are brown and appear duſty.

For ADIANTUM trapeziforme, which follows the above in Flo. Ang, and which is now found not to be a Britiſh plant, *ſee page 27*.

True Maiden-Hair is ſaid to grow on moiſt rocks and walls at Barry-Iſland, and Porth-Kirig, in Glamorganſhire. The ſpecimen from which I took my figure and deſcription grew amongſt the extenſive collection of rare and valuable plants in the rich and beautiful garden of the worthy John Blackburne, Eſq; of Orford, near Warrington, Lancaſhire.

TRICHOMANES

TRICHOMANES. Lin. Gen. Pl. 1181.

TRICHOMANES pyxidiferum.

Lin. Sp. Pl. 1561. *Ray Syn.* 127. *Tab.* 3. *Fig.* 4, 5. *Flo. Ang.* 461.

T A B. XXX.

CUP TRICHOMANES.

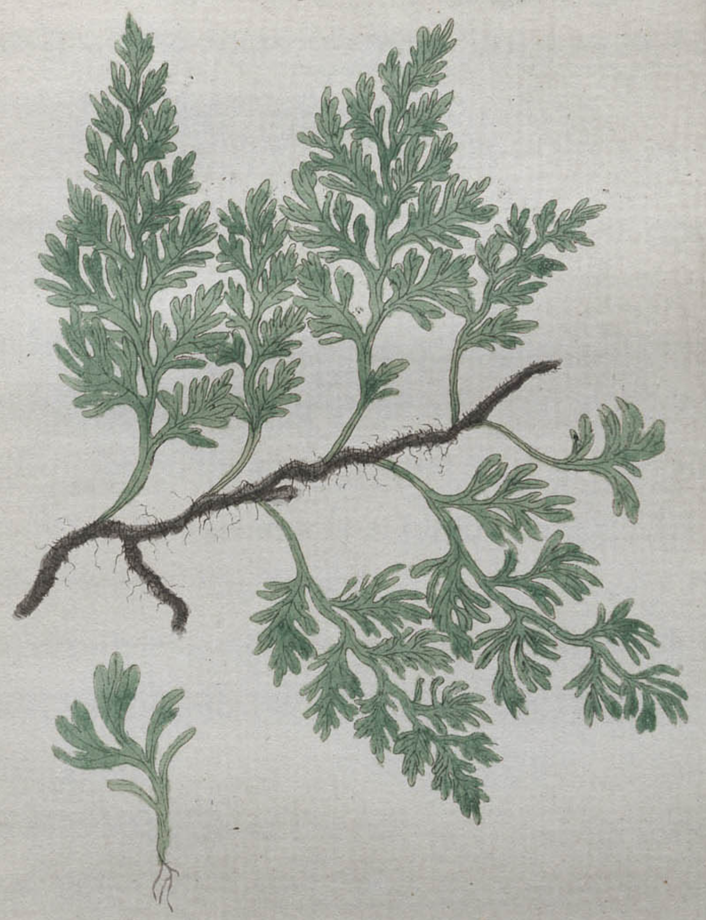
THE roots are ſlender, filiform, branched, creeping, and furniſhed with innumerable extremely ſhort and erect fibres, by which it adheres to and creeps along the moiſt rocks in the dark caverns where it grows, juſt as the ſlender ſhoots of ivy creep along a wall or the bark of a tree.

Firſt leaves two or three inches long; the rib like an hair, with a membrane on each ſide formed by the decurrency of the ſecond leaves; outline of the leaves a long oval, more pointed above, leaves riſing at diſtances from the creeping root.

Second leaves four or five pairs, placed alternate, largeſt below, gradually diminiſhing to the top.

Lobes

Tab. 30.



Trichomanes pyxidiferum.

Lobes two or three pairs, alternate, gaſhed in two or three ſegments, which are obtuſe at their extremities, and ſome of them indiſtinctly waved or crenated on the edges; ſubſtance, a thin, light, pellucid, dark-green membrane, with a black hair-like nerve running up the middle quite from the root to the top along the middle of the firſt and ſecond leaves the lobes and their ſegments. In the drawing and engraving of my figure, I have been painfully exact. The figure above referred to in Ray's Synopſis is of a firſt leaf very greatly exaggerated.

Seed veſſels, none ever diſcovered upon this *Phenomenon* of a plant.

Firſt diſcovered by Dr. Richardſon in a little dark cavern, under a dripping rock, a little below the ſpring of Elm Cragg Well, in Bell Bank, ſcarce half a mile from Bingley. In this place I ſaw it in plenty in the year 1758: afterwards ſome alterations being made about the well, for the convenience of the proprietor, the cavern was deſtroyed, the plant periſhed, and was loſt to Great-Britain till the year 1782; at which time being engaged in this work, and paſſionately deſirous to ſee the plant again in its growing ſtate, after ſeveral reſearches in Bell Bank, I found a root under a dripping rock, to the left ſide of the current, and about fifteen yards above the ciſtern. From this root I have ſent ſpecimens to one or two of my friends, and have in my poſſeſſion the beſt of them, from which this figure and deſcription was taken.

TRICHOMANES tunbrigenſe.

Sp. Pl. 1561. *Ray Syn.* 123. *Flo. Scot.* 681. *Flo. Ang.* 461.

TAB. XXXI.

TUNBRIDGE TRICHOMANES.

ROOTS ſlender, filiform, branched, furniſhed with very ſhort black fibres by which they creep along.

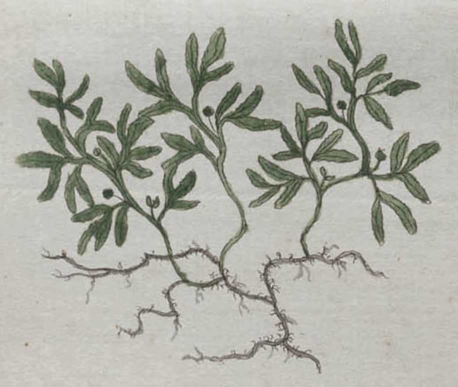
Firſt leaves one or two inches high, riſing ſingly and at diſtances from the root; rib hair-like, black, with a membrane on each ſide, formed of the decurrent part of the ſecond leaves; general outline of the firſt leaf, oval, narroweſt towards the top.

Second leaves two or three pairs, alternate, placed diſtant, decurrent, or with their bottoms running down the nerve of the firſt leaf.

Lobes two or three pairs, alternate, ſometimes ſimple, moſt commonly divided into two or three ſegments, of a longiſh oval ſhape, blunt at the extremity, ſometimes (not always) ſerrated or crenated on the edges, decurrent to the nerve of the ſecond leaf; ſubſtance thin, delicate, tender, and tranſparent, except the middle nerve, which is hard, black, fine as an hair, and runs along the central part of the firſt leaf, and all its diviſions.

Seed

Tab. 31.



Trichomanes tunbrigense. J.B.

Seed veſſels, globular, ſize of a ſmall muſtard-ſeed, ſupported on an hair-like footſtalk a line in length, and ariſing from the edge of the decurrent part of the membrane at the original of the ſecond leaves.

VARIETIES.

I ſuſpect the Trichomanes pyxidiſerum of Bell Bank to be a luxuriant variety of this plant; their figure, texture, colour, and whole habit are the ſame, only differing in magnitude. In this opinion I am confirmed by obſervation; for in the year 1784, I found the Trichomanes tunbrigenſe growing in great plenty on the rocks under Dolbadon Caſtle, near the lake of Llhanberris; in cavities where the rock was moiſt, and overſhadowed with other plants, ſo as to exclude the ſun, I found ſpecimens ſo far approaching to the Trichomanes pyxidiferum, as to form a connecting link between it and the Trichomanes tunbrigenſe, partaking equally of the one and of the other; one of theſe ſpecimens I have exactly figured *Tab. 2. Fig. 7.*

Trichomanes tunbrigenſe grows on moſſy rocks in the Weſt-Riding of Yorkſhire; particularly on the rock called Foal Foot, on Ingleborough-Hill. On the Welch mountains plentifully.

FINIS.

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[THOMAS WRIGHT, Leeds, Printer.]

ERRATA.

IN THE INTRODUCTION.

Page 12, Line 19, *eraſe* in.
— 13, — 16, *after* Marinum, *add*, Aſplenium adiantum nigrum.
— 16, — 16, *for* Equiſetum, *read* Equiſeta.

IN THE BOOK.

— 5, — 3, *for*, and the ſeeds when diſcharged, *read*, and when the ſeeds are diſcharged.
— 9, — 2, *for* red, brown, *read*, reddiſh brown.
— 28, — 14, *for* in, *read* by.
— 31, — 18, *for* Lychen, *read* Lichen.
Throughout, *for* Polipodium, *read* Polypodium.

FILICES BRITANNICÆ;

AN
HISTORY
OF
BRITISH FERNS.

PART THE SECOND.

With PLAIN and ACCURATE DESCRIPTIONS,
AND
NEW FIGURES of all the SPECIES,

Taken from an immediate and careful Inſpection of the Plants in their Natural State, Drawn of their Natural Size, and accurately Engraved.

INCLUDING
An APPENDIX to the FORMER PART of this WORK,
By which the Whole is completed.

By JAMES BOLTON,
Member of the Nat. Hiſt. Society, EDINBURGH.

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M,DCC,XC.

INTRODUCTION

CONTINUED.

THE Genus of Plants called *Equiſetum*, or Horſetail, conſtituting a Part of the Order FILICES in the LINNÆAN SYSTEM, together with the two other Genera, the *Iſoetes* and *Pilularia*, are the ſubject of the preſent Sheets.

The Horſetails, of which no more than ſix ſpecies have been diſcovered in Great Britain (by that fondneſs for increaſing the number of Plants which almoſt Univerſally prevailed amongſt the Botaniſts of the laſt ages) have been inincreaſed to double their real number, by the Addition of imaginary *ſpecies*.

Dillenius, in the third Edition of *Ray's Synopſis*, enumerates twelve ſuppoſed ſpecies; ſix of which, that are varieties only, and not ſpecies, I will here endeavour to point out.

There is a variety of *Equiſetum ſylvaticum*, not unfrequently to be met with by Road-ſides and in Pathways, having the ſecond leaves all turned to one ſide of the firſt leaf or *ſtem*; this happens when the firſt leaf has been trod down, or by ſome Accident ſo bent or broken as to lie flat on the Ground;

Ground; all the ſecond leaves naturally riſe upward, but they iſſue from all ſides of the firſt leaf at the baſe of the *vagina*, in the declined, as well as in the erect Plant; the Plant in this ſtate makes the

Equiſetum ſylvaticum procumbens ſatis uno verſu diſpoſitis. Ray Syn. P. 131. *No.* 5.

There is a Variety of *Equiſetum arvenſe*, which grows in very wet ſoils in cloſe woods, amongſt tall graſs or under the umbrage of various other Plants, in which the leaves are very ſlender, and greatly drawn out in length; in which ſtate it makes the

Equiſetum pratenſis longiſſimis ſetis. Ray Syn. 131. *No.* 8.

The fertile ſhoots of *Equiſetum arvenſe* come up before the barren ones; theſe are deſtitute of ſecond leaves, they are variegated with brown colours, and ſoon periſh; in this ſtate they are the

Equiſetum nudum minus variegatum baſilienſe. Ray Syn. P. 130. *No.* 3.

There is a variety of the *Equiſetum paluſtre*, which grows in ſhady ſituations or under trees, about the borders of ponds and brooks, wherein both the firſt and ſecond leaves are very ſlender, and drawn out in length, much beyond their uſual ſtandard, and are frequently of a pale yellow-green colour; this is the

Equiſetum paluſtre tenuiſſimis longiſſimis ſetis. Ray Syn. P. 131. *No.* 6.-----*This through miſtake has been made a variety of Equiſetum Arvenſe.*

There is another variety of *Equiſetum paluſtre*, in which the branches or ſecond leaves are fertile, producing ſmall flower ſpikes on their ſummits. This variety, in moſt inſtances where I have had an opportunity of obſerving it, has been occaſioned by that the primary flower ſpikes, of ſuch ſhoots as produced ſecondary ones, had been bit off or otherwiſe deſtroyed; this variety is the

Equiſetum paluſtre minus polyſtachion. Ray Syn. P. 131. *No.* 7. *Tab.* 5. *Fig.* 3.

When the *Equiſetum limoſum* grows in the mud at the bottom of ſtill ponds or rivers, and is in a luxuriant ſtate, it commonly produces plenty of branches or ſecond leaves; in which ſtate it makes the

Equiſetum foliis nudum ramoſum. Ray Syn. 132. *No.* 12.

There is a variety of *Equiſetum hyemale*, in which the leaves are ruſh-like, quite ſimple, and deſtitute of branches; in this ſtate it makes the

Equiſetum foliis nudum non ramoſum ſue junceum. Ray Syn. 131. *No.* 11.

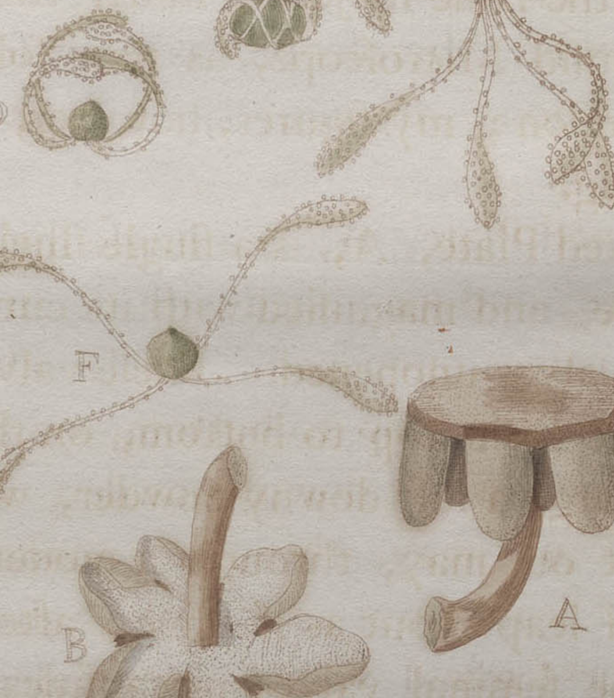
The manner in which the ſeeds of the Horſetails are diſcharged is beautiful, and well deſerves our regard. The laborious and ingenuous Hedwig has well illuſtrated this particular, by a number of figures, in his *Theoria Pl. Crypt. Tab.* 1, 2. And I have found the truth of his Obſervations by examining the ſame ſubjects, under the firſt magnifier of Cuff's Compound Microſcope, as now ſold by *Nairn* and *Blount*, in London; my figures, however, vary a little from thoſe of Hedwig.

In the annexed Plate, A, is a ſingle ſhield ſeparated from the flower ſpike, and magnified with its curved ſupport, and its ſix ſeminal valves unopened. Theſe valves open by a longitudinal ſuture from top to bottom, on the inner ſide, and copiouſly diſcharge a ſoft downy powder, which when newly fallen or ſhook out may, through a moderate ſpy-glaſs, be ſeen to ſkip and leap about as if alive; after the diſcharge of this powder the ſeminal valves or capſules remain for ſome time in an horizontal direction, empty and dry, as is expreſſed at B; where the underſide of the ſhield and the inſide of the valves are repreſented.

The ſeparate ſeed-veſſels, if ſuch we may call them, conſiſt of an oval placenta, and four ſpoon-ſhaped filaments or ſtraps; to theſe laſt the ſeeds immediately adhere. While

theſe

32



theſe ſeed-veſſels are included in the ſeminal valves, the ſtraps are rolled round the placenta, in two oppoſite ſpiral directions, as is expreſſed at C, where they are beginning to unroll; at D, they are repreſented as farther diſengaged; at F, they are quite expanded; and at G, the elaſtic force of the filaments being quite exhauſted, they are at reſt. This unrolling of the ſtraps or filaments, however, is not gradual, as I have repreſented it, but performed in an inſtant, by a ſudden jerk; by which the ſeeds are thrown off with force, and committed to the air, where they float innumerable. *What is their uſe?* Certainly they are produced for other purpoſes beſides the propagation of the ſpecies; every perfect ſeed ſpike produces millions of theſe, and yet the plant is propogated by the root; nay, ſo rarely do the ſeeds anſwer the purpoſe of propogation, in this family, that I could never yet diſcover a ſeedling plant of any one of the ſpecies.

The ſame obſervation holds good, in reſpect to all the other Ferns, and to the Fungi; the multitude of ſeeds produced by an Agaric or a Boletus, is innumerable! is aſtoniſhing! yet not one of ten thouſand anſwers the purpoſe of propogation. Is not the Air we breathe charged with them all the declining part of the year? Do we not receive them into our Lungs with every breath we draw? Whence proceed the

Quinſies,

Quinſies, Coughs, and other complaints, which prevail in Autumn?

I am not here to inquire into their noxious or ſalutary effects, when received into our Lungs; yet it cannot ſurely be amiſs, to drop this ſhort hint to thoſe whoſe province it is to make ſuch inquiries.

Stannary, near *Halifax*,
October 16, 1790.

FILICES BRITANNICÆ.

PART THE SECOND.

EQUISETUM.

Lin. Gen. Plan. 1169.

EQUISETUM ſylvaticum.

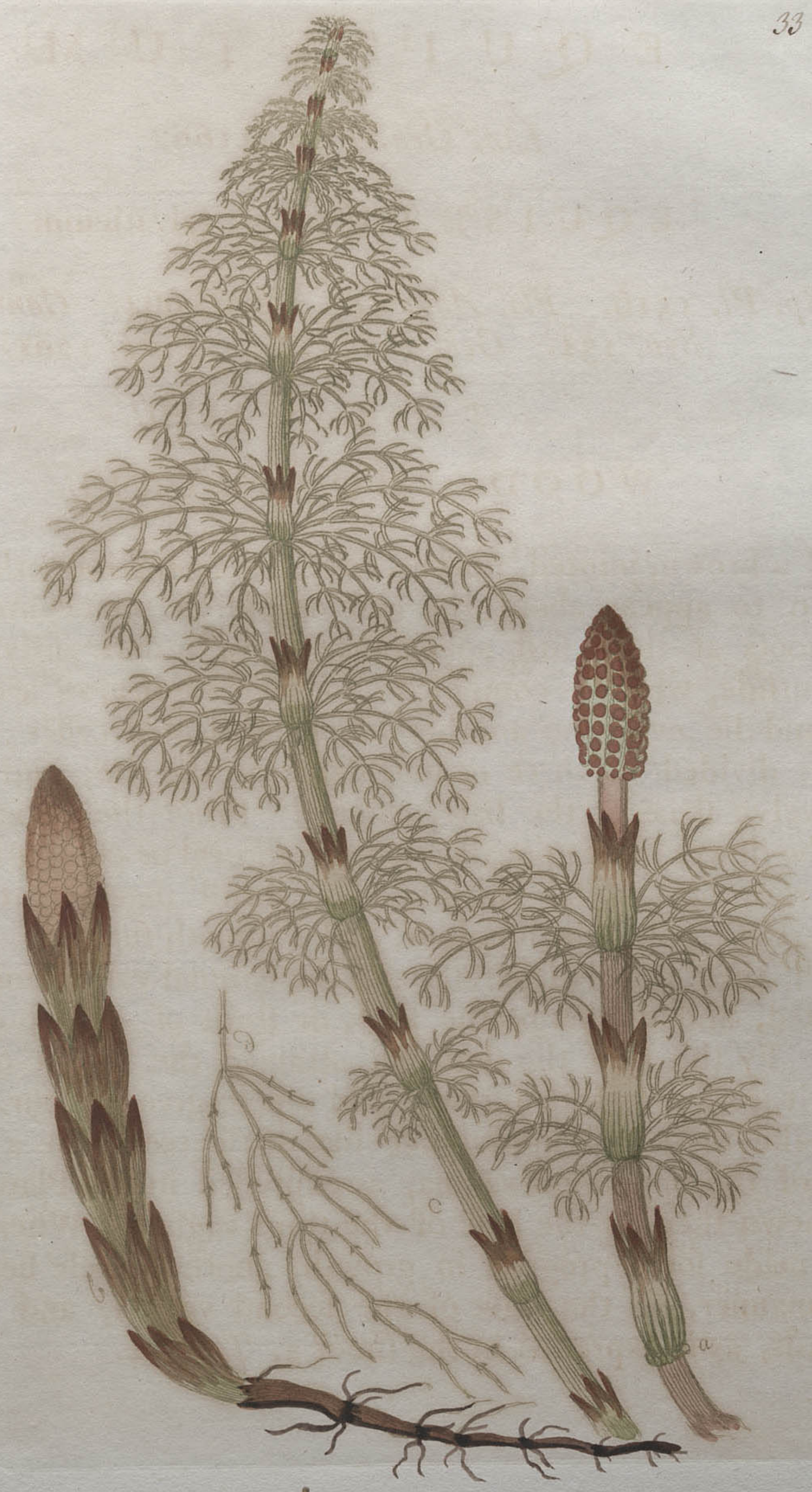
Lin. Sp. Pl. 1516. *Flo. Ang.* 447. *Scot.* 664. *Cant.* 383. *Ray Syn.* 131. *Ger. Em.* 1114. *Park.* 1201.

TAB. XXXIII.

WOOD HORSETAIL.

FROM a brown, jointed, fibrous, tough, creeping root, the fertile ſhoots begin to appear about the end of March, or beginning of April. Theſe ſhoots at their firſt appearance are of a dark ruſty-brown colour on the outſide, which is compoſed of ſeveral vaginæ, of a thin filmy ſubſtance, and lie over one another in an imbricated order; each ſeparate vagina is divided in three or four dents at the rim, and marked with about twelve ſtriæ at the baſe, as at b. From the uppermoſt of theſe vaginæ the flower ſpike appears; it is of an oval or oblong figure, conſiſts of numerous hexangular ſhields, cloſe thruſt together, their upper or naked part of a pale brown colour, and a ſmooth ſurface. As it advances in growth, theſe ſhields ſeparate, and the ſeminal valves under each ſhield are librated, and diſcharge the ſeeds in form of a ſoft, downy, bluiſh powder. By this time the ſtem has attained the height of eight or ten inches; it is of a ſmooth ſurface, and a pale-green colour. The ſecond leaves make their firſt appearance like little teeth, in a circle, round the baſe of the uppermoſt vagina, as expreſſed in the Plate at a; where I have ſhewn them at the baſe of the third vagina. When this firſt circle has made ſome progreſs in growth, another circle begins to appear in like manner, at the baſe of the ſecond vagina, and thus proceeds downwards, as is expreſſed in the ſhoot a, *Tab.* 34.

The



The ſecond leaves are jointed, and have vaginæ at the joints; from the baſe of which vaginæ the third leaves are produced, three or four from each joint.

Theſe third leaves, like the firſt and ſecond, are jointed and vaginated; and, in ſome luxuriant ſpecimens, I have ſeen fourth leaves of a ſimilar ſtructure.

BARREN LEAVES, *Fig.* c.

Theſe ſpring from different parts of the ſame root, which produces the fertile ones, and like thoſe are at firſt wholly covered with vaginæ, but are readily diſtinguiſhed from them, by being much ſmaller, and of a pale, duſky, green colour.

From the uppermoſt vagina, the rudiments of the ſecond leaves make their firſt appearance, in form of a cloſe, rough, pale-green, tapering ſpike.

The vaginæ are green, except at the point, where they are divided in four brown dents, as in the fertile ſhoots; but in this they are ſmaller, and embrace the ſtem more cloſely than in that.

The ſecond leaves are about twelve in number, produced in circles from the baſe of the vaginæ, each having a proper, brown, ſhort, tridentate vagina, at its baſe; they are quadrangular, jointed, and have quadridentate vaginæ, from the baſe whereof grow the third leaves, three or four at a joint, and are of the ſame ſtructure with the ſecond. A full grown ſecond leaf is ſeen in the Plate, at d.

It grows in wet, ſandy ſoils, in woods and meadows about *Halifax*, abundantly.

EQUISETUM arvenſe.

Lin. Sp. Pl 1516. *Flo. Angl.* 447. *Scot.* 647. *Cant.* 344. *Ray Syn.* 130. *Ger. Em.* 1114. *Park.* 1202.

TAB. XXXIV.

CORN HORSETAIL.

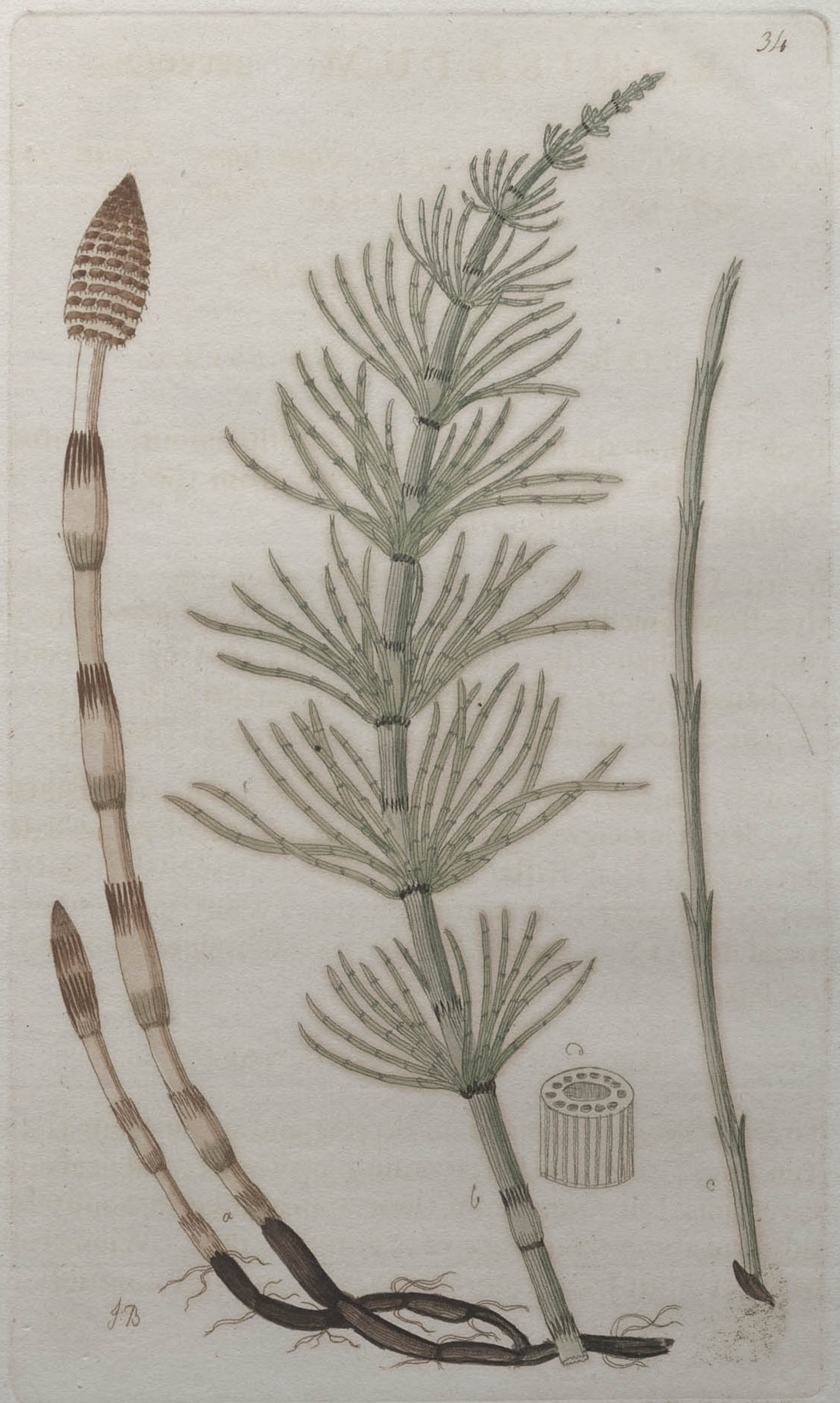
THE root is of a dark brown or blackiſh colour, jointed at equal diſtances, emits numerous black fibres from the joints, and creeps to a great diſtance under the ſurface.

The fertile ſhoots at *a*, make their appearance about the end of March; the flowering ſpike being at firſt hidden under the brown imbricated vagina; when the ſpike firſt appears it is of a greeniſh colour, afterwards changes to brown, and when at maturity the valves open, and diſcharge a pale coloured downy powder, which is the ſeed.

The ſtem is round, ſmooth, hollow, and of a pale pleaſant brown, it conſiſts of ſeven or eight joints, each ſurrounded by the baſe of a fuſcous vagina, which is a little inflated, and divided at the top in about twelve narrow, pointed, brown ſegments. This ſtem very rarely produces any ſecond leaves; it generally falls and diſappears before the appearance of the barren leaves.

BARREN LEAVES.

The barren leaves, b, appear in April, and grow from the ſame roots as the fertile ones; at their firſt coming up the ſecond leaves are hidden under the vagina, but ſoon make their appearance in about twelve ſhort whirls, and form the reſemblance of a rough ſpike. When full grown it is about two feet high from the root to the top, and conſiſts of fifteen or twenty



twenty joints; five or ſix of which joints are deſtitute of ſecond leaves, but are, as well as the reſt, ſurrounded each with a vagina, not inflated as in the fertile ſhoot, but cloſely embracing the ſtem; they are of a pale-green colour, and each is divided in about twelve black acute points at the margin.

The ſecond leaves grow from the baſe of the vaginæ, at the joints of the firſt leaf; each has a pale-coloured, pellucid, quadridentate, proper vagina, at its baſe; each conſiſts of eight or ten joints, quadrangular, with quadridentate vaginæ at each joint. In the ſpecimen before me, the firſt leaf conſiſts of ſixteen joints, five of which, from the root, produce no ſecond leaves; at the ſixth the leaves are ſhorter than at the ſeventh, and grow gradually a little longer upwards to the tenth, from whence they diminiſh to the top, where they are ſhorteſt.

The barren leaves in this plant ſo nearly reſemble thoſe of the Equiſetum paluſtre, in ſome ſtages, that they are not eaſily diſtinguiſhed at firſt ſight; but may at all times be known by this remark, That the ſecond leaves in the arvenſe are quadrangular, and the vaginæ quadridentate; but in the paluſtre they are pentangular and quinquidentate.

The fertile ſhoots of this ſpecies cannot be diſtinguiſhed from thoſe of the Equiſetum ſylvaticum, before the ſecond leaves appear, except by the number of laſcinæ into which the vaginæ are divided, in the firſt being twelve, in the laſt three or four.

It grows in ſhady moiſt places about woods and rivulets, and flowers in April.

EQUISETUM paluſtre.

Sp. Pl. 1516. *Flo. Angl.* 448. *Scot.* 648. *Cant.* 384. *Ray Syn.* 131.
Tab. 5. *Fig.* 3. *Var.* b. *Ger. Em.* 1113. *Park.* 1202.

TAB. XXXV.

MARSH HORSETAIL.

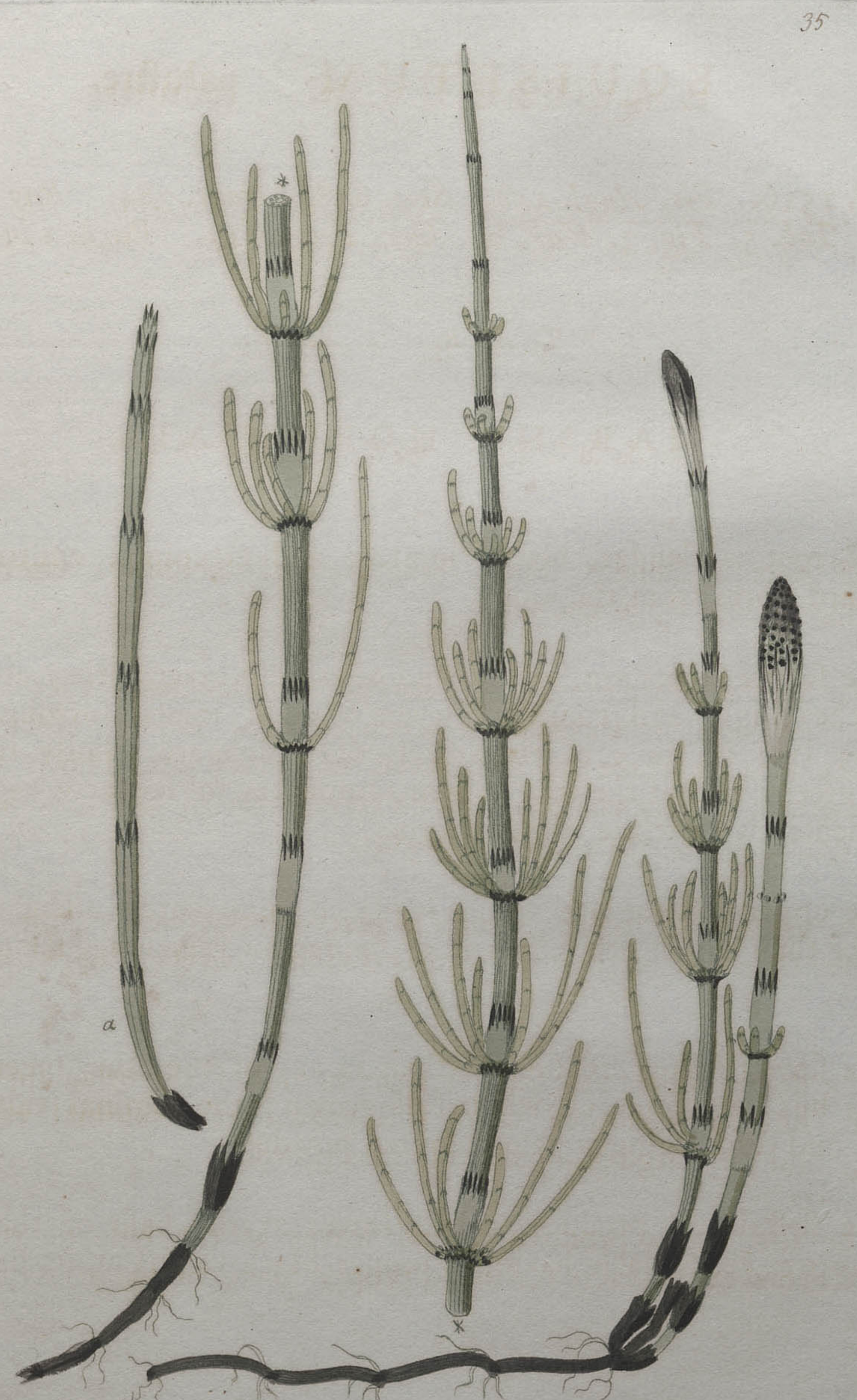
THE root is ſlender, black, jointed, and creeping; emitting black hard fibres from the joints.

The fertile ſhoots are ſlender, and of a freſh green; they are eight or ten inches high, and conſiſt of ſeven or eight joints, ſurrounded with vaginæ; two or three of the loweſt of which are wholly black, the others green, except the top, which terminates in ſeven or eight black acute dents, with white filmy margins.

The uppermoſt vagina, which is placed immediately under the ſpike, is longer than any of the reſt, and is divided in very long, ſlender, black dents.

The flower ſpikes are ſmaller than in any of the other ſpecies, black at firſt, but pale-coloured when full grown; the ſeminal valves being white, and diſcharging a pale-coloured powder.

The firſt leaves produce ſecond leaves at the baſe of the vaginæ, which grow erect, each having a proper black vagina at its baſe; they are



are unequal in length, conſiſting of an uncertain number of pentangular joints, with quinquidentate black vaginæ at each joint.

BARREN LEAVES,

Theſe grow from the ſame root with the fertile ones, and reſemble them in ſubſtance and colour, but are taller and conſiſt of more numerous joints; in a full grown plant, twenty or more; and the ſecond leaves are alſo longer and more numerous. One of the ſecond leaves is a little magnified at a.

It grows in marſhy places, about brooks and woods. On the banks of the canal below *Mear-Clough-Bottom*, near *Halifax*, plentifully, along with the two former ſpecies; it flowers in May.

It is diſtinguiſhed from the Equiſetum limoſum, by being a leſſer plant, by its ſmall black root, by having fewer dents in the vagina, and in that the firſt leaves always produce ſecondary ones about the joints; but in the limoſum they are frequently naked.

Sometimes the ſecondary leaves are fertile, producing ſmall flower ſpikes on their ſummits, as figured by Dillenius, in Ray's Synopſis, *Pl.* 5. *Fig.* 3.

I have ſeen the ſecondary leaves fertile, but never, except in inſtances where the primary flower ſpike had been bit, or accidentally broken off.

EQUISETUM

EQUISETUM fluviatile.

Sp. Pl. 1517. *Flo. Ang.* 448. *Scot.* 649. *Cant.* 385. *Ray Syn.* 130. *Hall. Hiſt.* 1675. *Ger. Em.* 1113. *Park.* 1290.

TAB. XXXVI. XXXVII.

RIVER HORSETAIL.

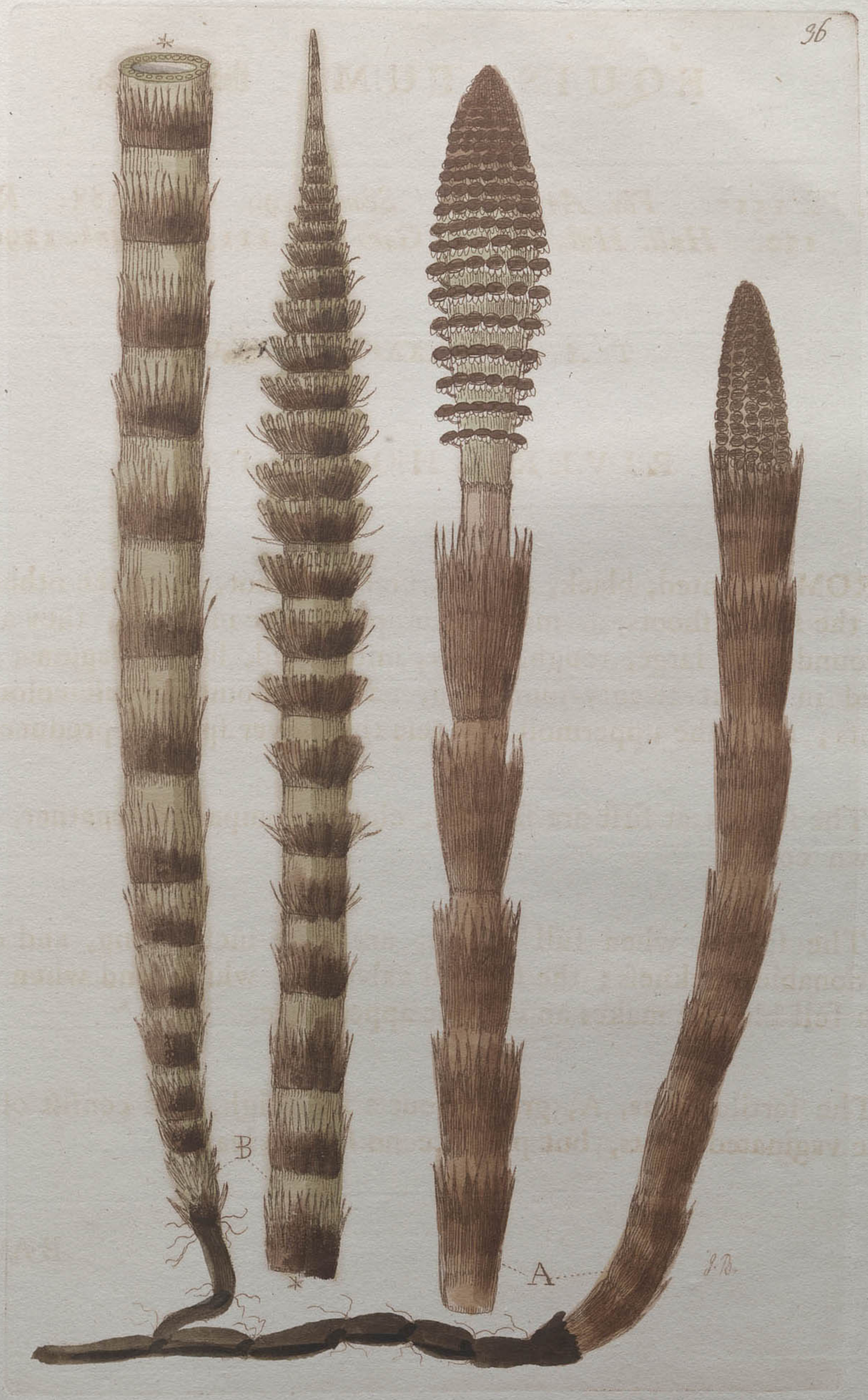
FROM a jointed, black, fibrous, creeping root, as in the other ſpecies, the fertile ſhoots, a. make their appearance in April; they are at firſt ſurrounded by large, rough, huſky, imbricated, brown vaginæ; each divided in about twenty-four long, narrow, pointed, ruſt-coloured ſegments; from the uppermoſt of theſe the flower ſpike is produced.

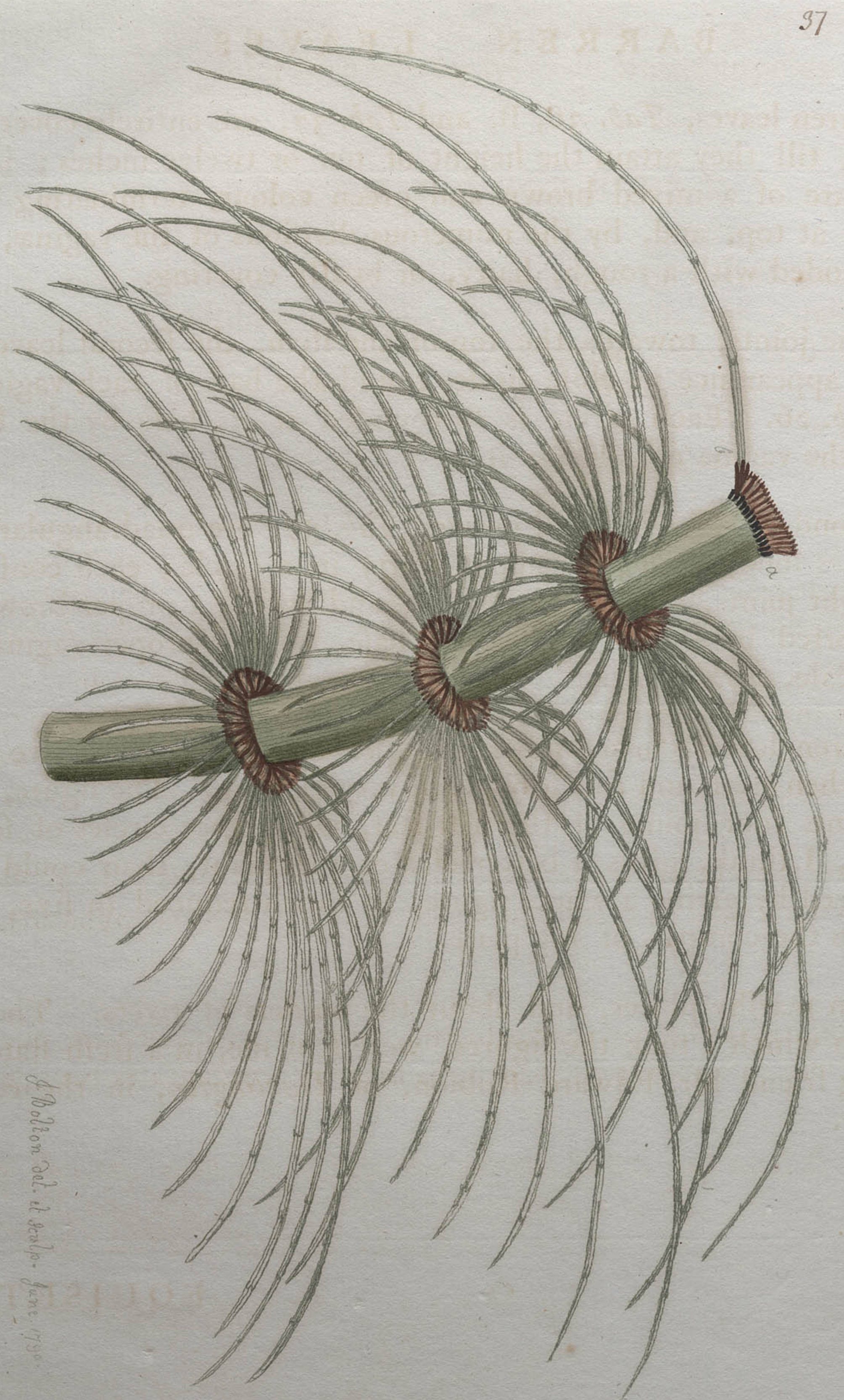
The ſhields at firſt are ſmooth, cloſely compacted together, and of a brown colour.

The ſpikes, when full grown, are three inches long, and of a proportionable thickneſs; the ſeminal valves are white, and when the ſpike is in full blow it makes an elegant appearance.

The fertile ſtems, A, grow about a foot high, and conſiſt of eight or nine vaginated joints, but produce no ſecond leaves.

BARREN

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J. Bolton del. et sculp. June 1790

BARREN LEAVES.

The barren leaves, *Tab.* 36, B. and *Tab.* 37, are entirely covered by the vaginæ, till they attain the height of ten or twelve inches; in this ſtate they are of a mixed brown and green colour, terminating in an acute point at top, and, by the numerous diviſions of the vaginæ, ſeem as if ſurrounded with a rough, hairy, or briſtly covering.

From the joints, towards the top of the ſtem, the ſecond leaves firſt make their appearance in cloſe circles round the baſe of each vagina, as *Fig.* B. *Tab.* 26. Each circle is ſurrounded at its baſe by the brown laſcinæ of the vagina next below it.

The ſecond leaves when full grown, *Tab.* 37, are quadrangular, five or ſix inches long, and grow about thirty in a circle; each conſiſts of ſeven or eight joints, with black vaginæ, and having a proper brown vagina, ſupported by a black ſcale at its baſe. b, the proper vagina. a, the black ſcale, *Tab.* 37.

The barren leaves, in a proper ſoil, riſe to the height of five or ſix feet, and when freſh and full grown are very elegant. The figure, *Tab.* 37, repreſents four joints of the firſt leaf, with three circles of ſecond leaves, and, I think, gives a better idea of the plant, than could have been conveyed by giving a whole figure, ſo much reduced in ſize, as to bring it into the compaſs of my plate.

Grows in marſhy places, and about the borders of rivers. The ſpecimens from which I took the figures, were ſent me, in a freſh ſtate, by my obliging friend Mr. Edward Robſon, of *Darlington*, in the county of *Durham*.

EQUISETUM limoſum.

Sp. Pl. 1517. *Flo. Ang.* 448. *Scot.* 648. *Cant.* 385. *Ray Syn.* 131. *Tab.* 5. *Fig.* 2. *Hall. Hiſt.* 1677.

TAB. XXXVIII.

SMOOTH HORSETAIL.

THE root, A, is large, tough, branched, jointed, and vaginated; it is of a ruſty brown colour, and creeps horizontally under the mud.

The young ſhoots appear in April, and are covered with brown ruſt-coloured vagina; each of which is divided in twelve or fourteen black acute dents, at the top. The ſpaces between the vaginæ are of a pale green, and ſmooth ſurface.

In the full grown plant, the vaginæ change to a pale green, retaining only a faint tinge of brown near the baſe of the dents, which ſtill remain black. The uppermoſt vagina of the fertile leaf is paler, more large, more lax, and the black dents longer than in the reſt; and the ſtem above it, which ſupports the flower ſpike, is white.

The ſhields, which compoſe the flower ſpike, are at firſt black, and cloſe thruſt together; when the ſpike opens, the ſeminal valves are of a pale colour, and copiouſly diſcharge a white powder.

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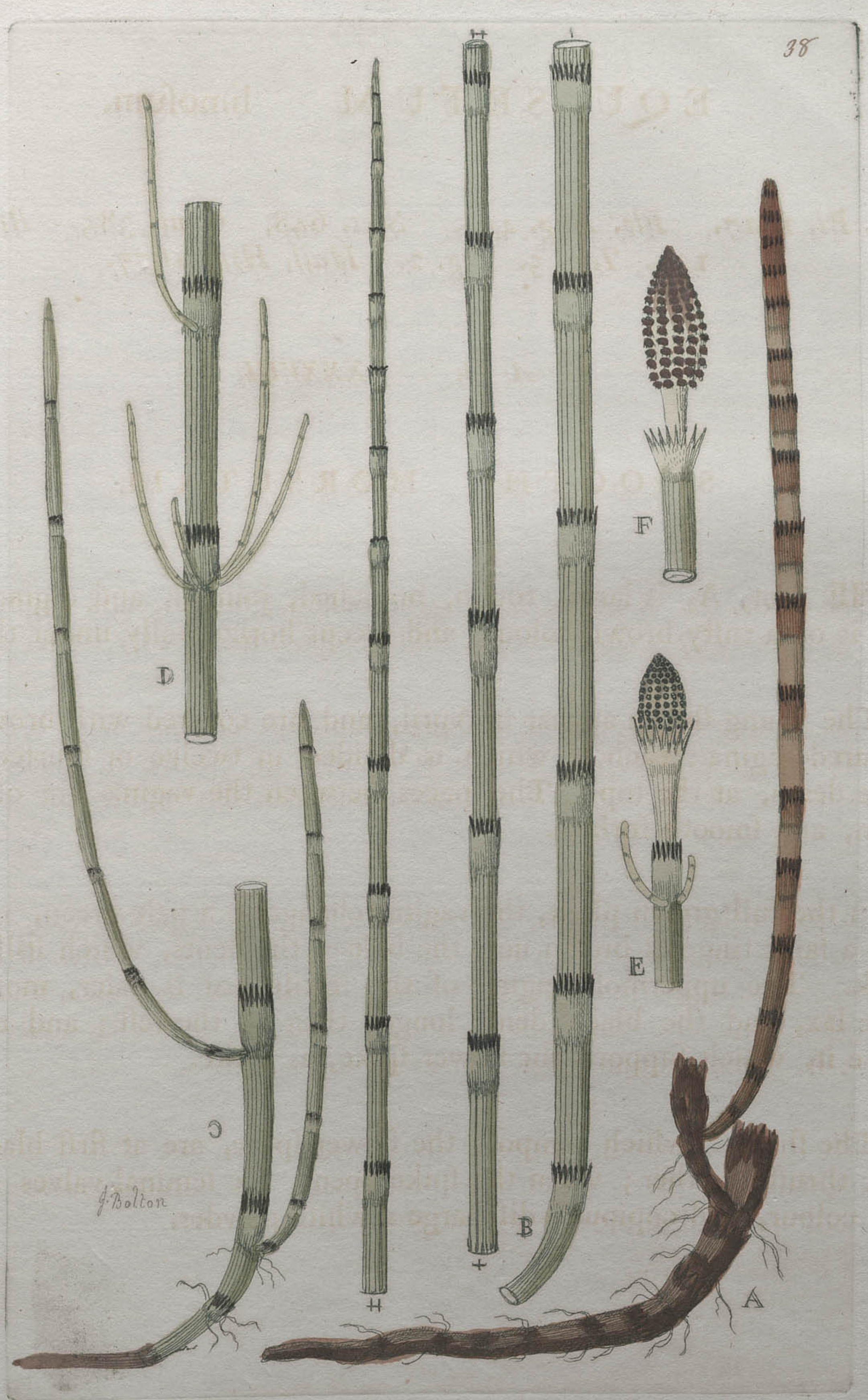


The fertile leaves conſiſt of fewer joints than the barren, and ſometimes produce a few ſecond leaves at the baſe of the vaginæ.

BARREN LEAVES,

The barren leaf which is cut into three parts, in the plate, *Fig.* B, riſes from the ſame root as the fertile leaf, and conſiſts, when full grown, of twenty-ſix or thirty joints, riſes to the height of three feet or more, is of a freſh green colour, and ſmooth ſurface, while young; when dry, becomes channelled, with twelve or fourteen furrows. The joints are cloſely embraced by the vaginæ, while the plant is freſh; when dry, the ſtem is contracted, the vaginæ are lax, and ſpread out at the margin.

The firſt leaves are moſt commonly ſimple and naked, as at B; but ſometimes one or two branches riſe from the lower joints, as at C; which branches are of the ſame ſtructure as the firſt leaf or principal ſtem.

The firſt leaves alſo ſometimes produce proper ſecond leaves, D, from the baſe of the upper vaginæ; two or three of theſe at a joint, ſometimes, though rarely, ſix or ſeven; they are unequal in length, jointed, pentangular, and the joints ſurrounded with a black quinquidentate vagina.

Grows in ſhallow ponds and ſtanding waters; and flowers in May.

EQUISETUM

EQUISETUM hyemale.

Sp. Pl. 1517. *Flo. Angl.* 448. *Scot.* 650. *Cant.* 385. *Ray Syn.* 131. *Hall. Hiſt.* 1679. *Ger. Em.* 1113. *Park.* 1207.

TAB. XXXIX.

ROUGH HORSETAIL.

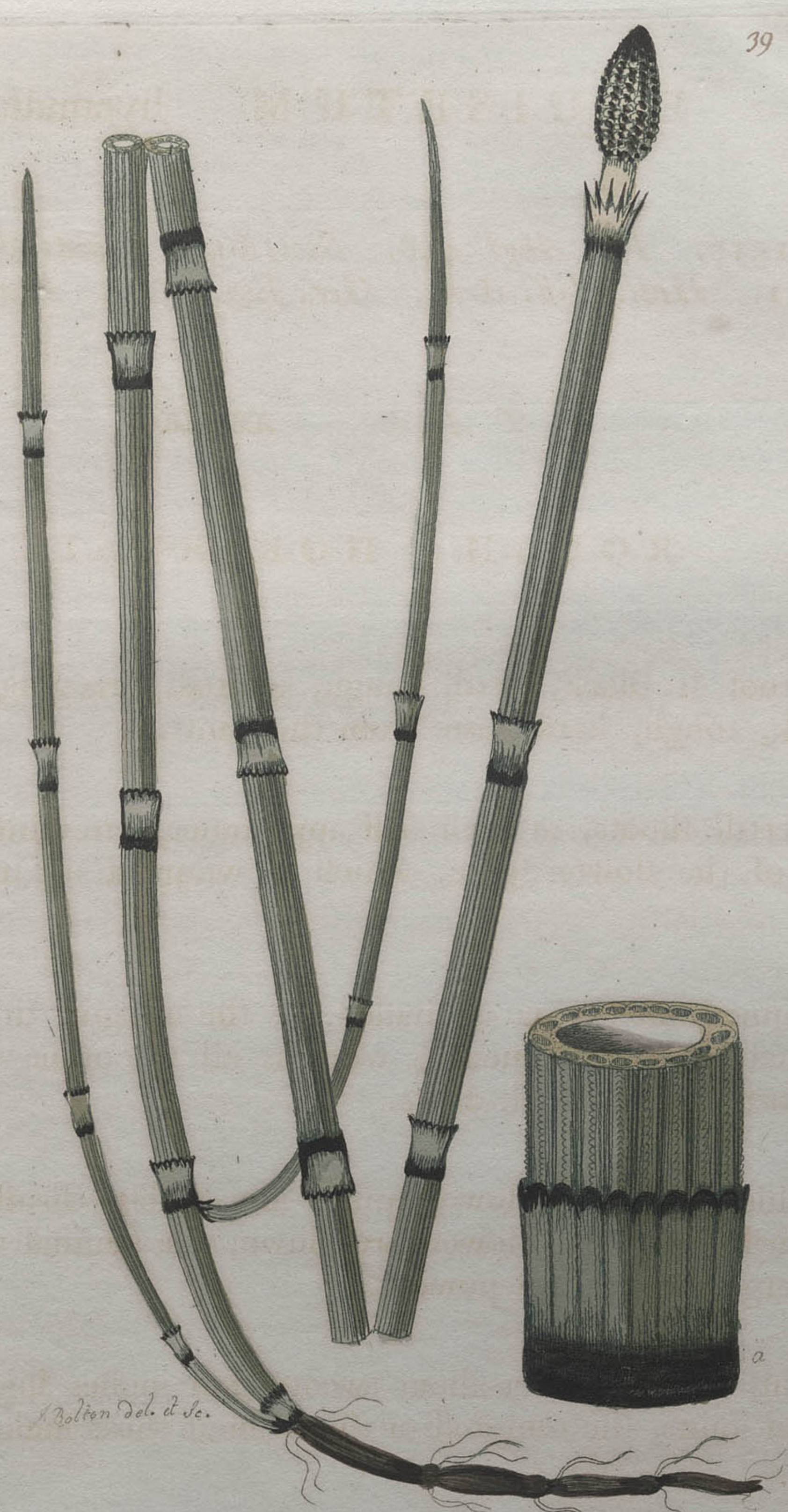
THE root is black, hard, tough, jointed, creeping, and emitting black, tough, hard fibres from the joints.

The fertile ſhoots, at their firſt appearance, are clubbed at the top, by reaſon of the flower ſpike, which is wrapped up in the uppermoſt vagina.

This uppermoſt vagina is divided, at the margin, in twelve or fourteen pointed dents or ſegments; whereas all the other vaginæ terminate in very ſhort, blunt, black dents.

The ſhields, in the flower ſpike, are cloſely thruſt together, and black at firſt; when the flowers are blown, the ſeminal valves are white, and diſcharge a bluiſh ſoft powder.

The full grown ſtem is about twenty-four inches high, conſiſting of nine or ten joints, the remoteſt of them about three inches aſunder; and
each



each ſurrounded with a ſhort lax vagina, black at the baſe and margin, but of a pale green in the middle.

The ſpaces between the joints are of a ſtrong bluiſh green, channelled with twelve or ſixteen furrows, and having alternate ridges, which are armed with hard, ſhort, rough ſpines, regularly placed in one line, along each ridge, as is expreſſed at b; where a vagina, a, and part of the ſtem are magnified.

The ſtem, as in the other ſpecies, conſiſts of a number of fiſtular tubes, which are bound together by an external and internal bark, and form one general fiſtular tube. In this ſpecies the inner bark is ſmooth and white.

The barren leaves in this ſpecies are not to be diſtinguiſhed from the fertile in any thing, but the want of fructification, and in their upper extremities terminating in a fine point.

Both the one and the other are moſt commonly ſimple, but ſometimes emit one or two branches from the lower joints, as is expreſſed in the plate. Theſe are of the ſame figure and ſtructure as the primary leaves, only ſmaller, and conſiſting of fewer joints.

This ſpecies is diſtinguiſhed by the ſhort obtuſe dents of the vaginæ, by the remoteneſs of the joints, by the roughneſs of the touch, and by being an evergreen.

The only places where I have ſeen it grow, are amongſt the buſhes cloſe by the brook at the lower end of the *Helk*, near *Ingleton*; and in a field, belonging to an eſtate called *Upper Brier*, in *Northowram*, near *Halifax*.

PILULARIA.

Lin. Gen. Plan. 1183.

PILULARIA globulifera.

Sp. Pl. 1653. *Flo. Ang.* 462. *Scot.* 682. *Ray Syn.* 130. *Vail. Paris. Tab.* 15. *Fig.* 6. *Dill. Muſc. Tab.* 79, *Fig.* 1. *Flo. Dan. Tab.* 223.

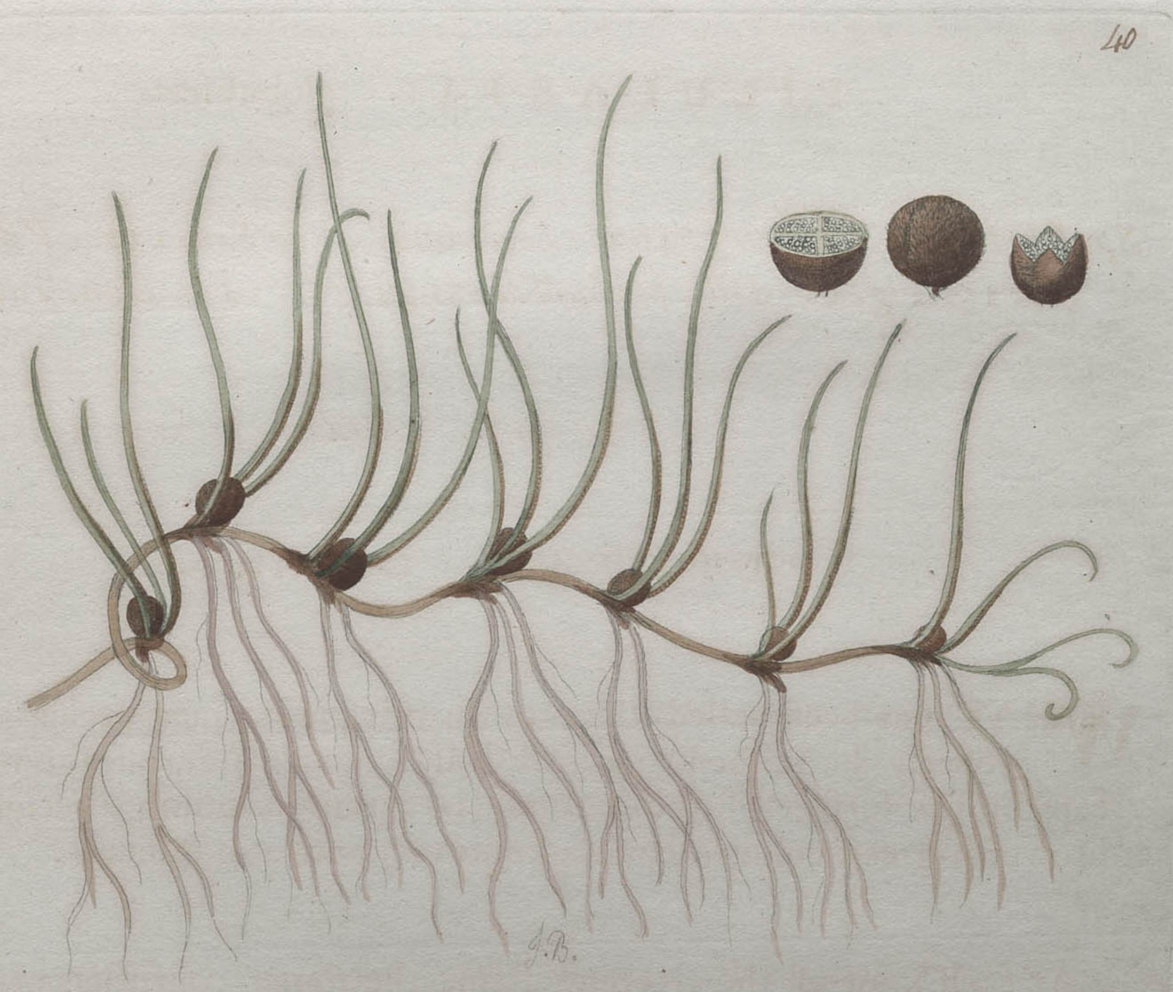
TAB. XL.

PEPPER GRASS.

WHAT has been called the root in this plant, may perhaps not improperly be termed the firſt leaf, or main ſtem of the plant. It creeps on the ſurface of the ground, in various winding directions, is of a browniſh-green colour, having knots or joints at diſtances.

At each knot of the creeping ſtem, the roots, conſiſting of three or four ſtrong white fibres, run down into the moiſt ſand, among which it grows; and at the ſame knots or joints, on the upper ſide of the ſtem, the ſecond leaves are produced, two or three together. While young they are coiled up in a cloſe curl, like moſt other of the ferns; when full grown they are about three inches long of a freſh green colour; each

one



one having a brown, duſky, granulated line, on the inner ſide; which is the male flower.

On the creeping ſtem, in the centre of theſe tufts of leaves, the ſeed-veſſels are produced; they are about the ſize of a pepper-corn, and of the ſame figure; at firſt green; when at full growth of a brown colour, and covered with a ſhort hairy ſhaggineſs; they are divided into four cells, and filled with ſmall, brown, globular ſeeds. When the plant dries it changes to a browniſh colour.

Grows in wet ſands, in places ſometimes overflowed with freſh water. It grows in ſeveral parts of *Wales*, and, as is ſaid, on *Honſlow-Heath*; and is in perfection in July.

ISOETIS.

Lin. Gen Plan. 1184.

ISOETIS lacuſtris.

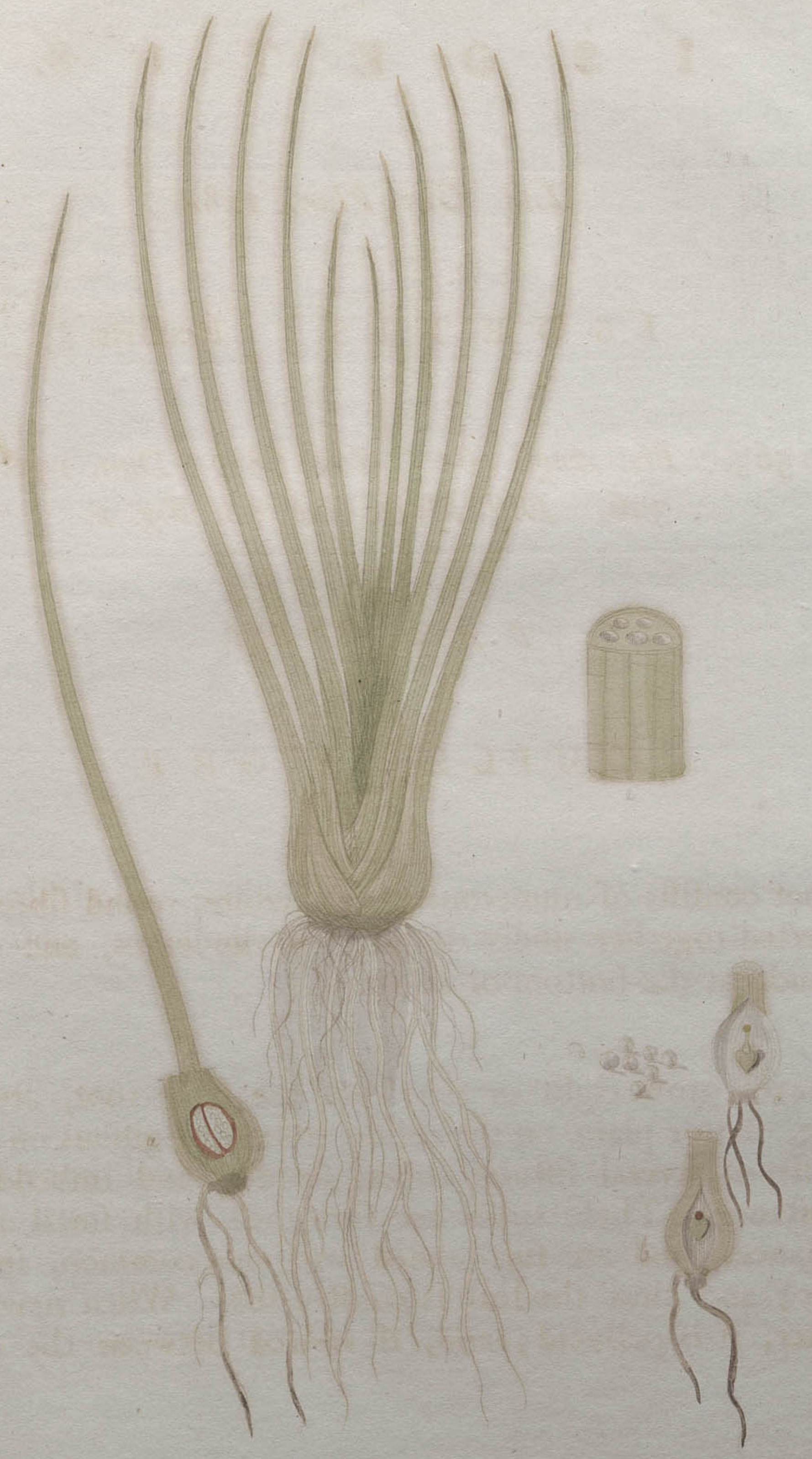
Sp. Pl. 1563. *Flo. Angl.* 462. *Scot.* 683. *Dan.* 191. *Ray Syn.* 306. *Dill. Muſc. Tab.* 80. *Fig.* 2.

TAB. *XLI.*

QUILL WORT.

THE root conſiſts of numerous ſtrong, white, round fibres, which are connected together under the baſe of the leaves, and deſcend deep into the mud, at the bottom of lakes.

The leaves grow eight or ten from the ſame root, are four or five inches long, flat or plain on the inſide, round or gibous on the outſide; each conſiſts of ſeveral fiſtular tubes, ſlender, and imbedded in a ſoft ſpongy ſubſtance. Theſe tubes are furniſhed with ſmall diafragms, at certain diſtances, and are ſurrounded with one common, ſmooth, pale-green cover; and thus the leaf is conſtructed. When newly taken out of the water, it is pellucid; and, if viewed between the eye and the light



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light, the diafragms, in the internal ſmall tubes, may be eaſily diſcerned.

The outer leaves are greatly ſwollen and dilated at the baſe, as at a, b, c; where the fructification is lodged. The ſtile and ſtigma are placed in the hollow part of the baſe of the outer leaves; the germin is ſupported by a cordate valve, or flower-cup, as at e; and the edges of the inflated baſe, of theſe outer or female leaves, is a thin fine membrane, which ſo cloſely embraces and ſurrounds the gibous part of the male leaf within as to exclude the water.

The inner or male leaf, b, opens on the outer or gibous ſide of the baſe, within the embraces of the female leaf. Its fructification conſiſts of a roundiſh anthera, without filament; and it reſts on a cordate valve or flower-cup, ſimilar to that of the female. By the above admirable contrivance, the two flowers come in near contact with each other, and, though in the bottom of deep lakes, are ſecured from the intruſion of the water.

The ſeed-veſſel is of an oblong form, conſiſting of two valves, filled with white globular ſeeds; each of which is girt round with a prominent ring, as at d. After the diſcharge of the ſeeds, the outer leaves fall off and periſh, and the next in order perform the ſame office a ſucceeding year; and the number of leaves is kept up by a ſupply of young ones from the centre.

Grows in lakes on high mountains. I have dragged it out of ſeveral lakes on *Snowden*, and it has been ſent me from *Weſtmoreland*.

AN

APPENDIX

TO THE

FIRST PART of this HISTORY of FERNS.

ACROSTICHUM. Part I. Page 21.

ACROSTICHUM alpinum.

Frondibus ſubbipinnatis, pinnis remotis ſubalternis, lobis rotundis ſubcrenatis ſubtus hirſutus, ſtipite lœvi. Pluk. Phyt. Tab. 89. Fig. 5. Barrelier Icon. 432. Fig. 2.

TAB. XLII.

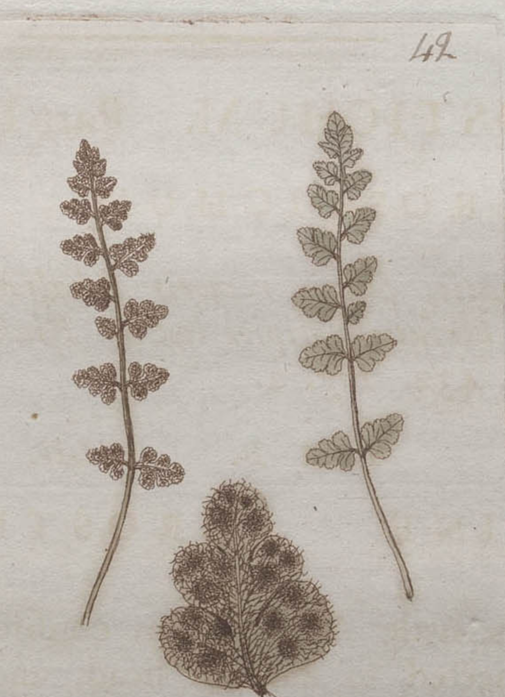
ALPINE ACROSTICHUM.

THE root of this little Acroſtichum conſiſts of a few black, hard branches, connected to a ſmall head, and furniſhed with black, hard, capillary fibres.

The rib of the firſt leaf, when full grown, is about three inches high, of a pale, browniſh-green colour, ſlender and ſmooth, being quite deſtitute of hairs.

Second leaves, ſix or ſeven pairs, oppoſite below, alternate above, of a triangular figure, obtuſe at the corners; three or four of the loweſt pairs being all of equal ſize, and remote; two or three of the upper gradually leſſening, and growing cloſer together.

Lobes



Strictly copied from the Plant by James Bolton

Lobes of the ſecond leaves moſt commonly five; two on each ſide of the rib, and one at the end; they are of a roundiſh figure, grow cloſe together, and are obſcurely crenated round the margin. The colour on the upper ſide is a browniſh kind of green; the underſide thickly covered with a brown hairy nap.

The lower figure repreſents one of the ſecond leaves, as it appeared when a little magnified; the ſeed veſſels are diſpoſed in three or four cluſters, on each lobe, partly hidden amongſt numerous, ſtrong, brown, hair-like filaments, by which alſo the whole under ſide of the leaf, quite to the margin, is thickly covered.

The ſpecimen above deſcribed is very exactly figured on plate 42, and is a plant ſo perfectly diſtinct from the Acroſtichum ilvenſe, in its uſual ſtate, that it ſeems to me unreaſonable to ſuppoſe them both of the ſame ſpecies.

The Acroſtichum ilvenſe, deſcribed in the former part of this work, page 14, and accurately figured on plate 9, was brought from *Snowden*. *Oeder*, in *Flora Danica*, has given an excellent figure of the ſame plant, *Tab.* 391. And the figure in *Pluk. Phyt. Tab.* 179, *Fig.* 4, (which is cited by Linnæus, in *Flo. Suecica*, *Ed.* 2. *No.* 938,) agrees pretty aptly with both *Oeder*'s and my own: But are all very different from the Acroſtichum alpinum above deſcribed.

The ſpecimen figured on plate 42, was brought from *Scotland*, but the plant is alſo a native of *South-Britain*; for in a volume of dried plants, collected by the late Mr. T. Knowlton, I have ſeen ſpecimens of the ſame plant, with this note, in his own hand writing, *From the Mountains of Wales.* From theſe, and ſome other circumſtances, I am induced to think, that two ſpecies of Britiſh Ferns have been confounded together, under the name of Acroſtichum ilvenſe; and I believe that future obſervation will confirm the truth now diſcovered.

ACROSTICHUM thelypteris.

Sp. Pl. 1528. *Flo. Suecica. Ed.* 2. 928. *Lobel. Icon.* 814. *Filix querna repens. Park.* 1041.

TAB. XLIII. XLIV.

LADIES' ACROSTICHUM.

THE root creeps horizontally under the ſurface of the ground, is of a black colour and brittle ſubſtance, crooked, and about the thickneſs of a duck's quill; it emits many branches, the ſize of ſmall packthread, which are hung round with numerous, dark brown, capillary fibres.

From the root, as it creeps along, the firſt leaves riſe at diſtances, two or three near together. The rib is from nine to fifteen inches high, ſmooth and naked, very ſlender, and of a pale herby colour.

The ſecond leaves from ten to fifteen pairs, oppoſite, except one or two of the loweſt pairs; lower pairs remote, growing gradually cloſer upwards, longeſt about the middle pair, all of them lance-ſhaped, and placed nearly at right angles with the rib of the firſt leaf.

Lobes of the ſecond leaves ten or twelve pairs, divided down to the nerve; they are broad, ſhort, rounded off at the extremity, and quite ſmooth and entire on the edges; their upper ſurface ſmooth and plain, not obviouſly marked with veins, as in the Polypodium thelypteris; this circumſtance, together with its creeping root, and its being a much

ſmaller

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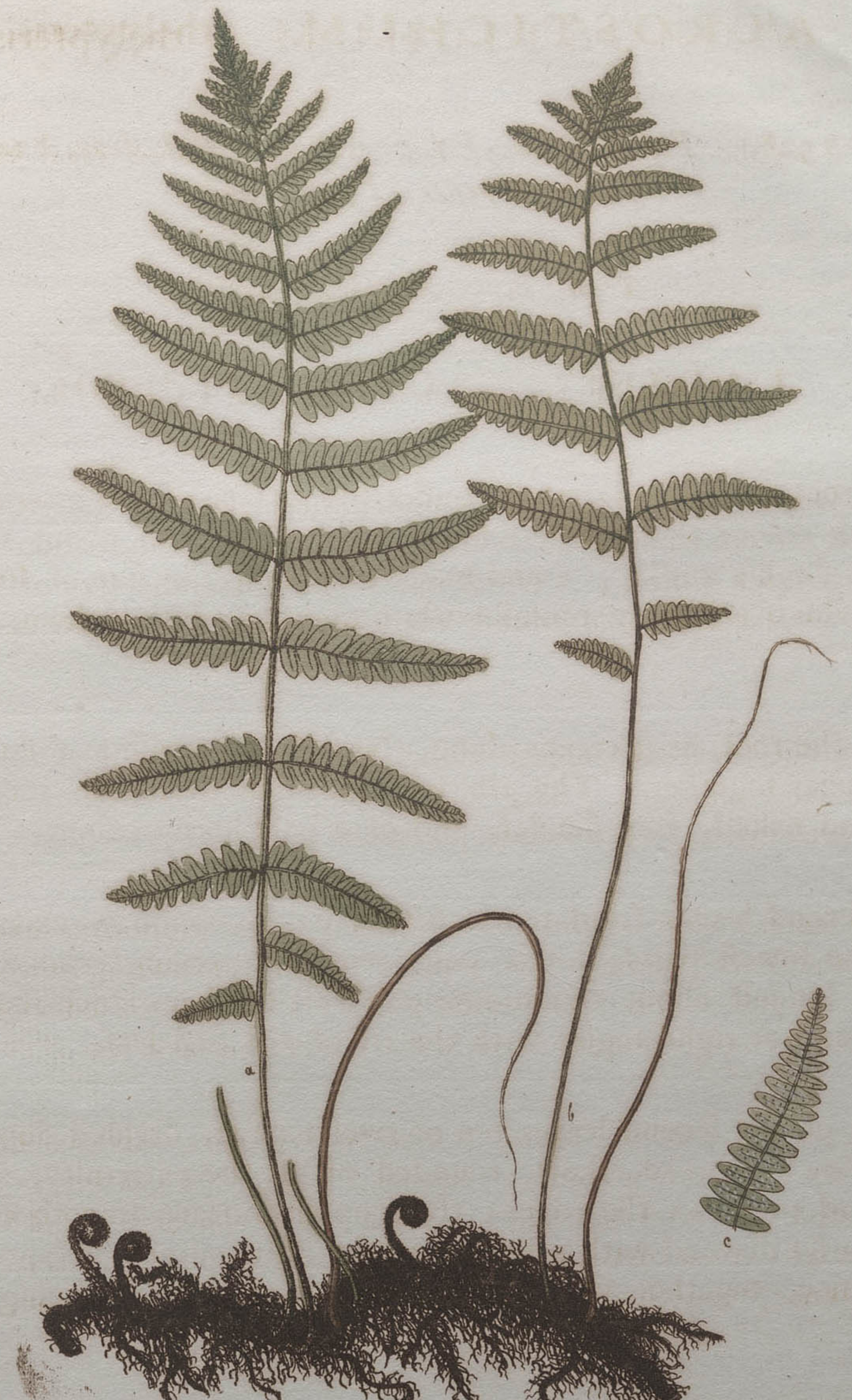


Etched on the Copper immediately from the Plant. September the 26. D 1790. By J. Bolton at Stannary near Halifax.

ſmaller plant, are ſufficient at all times to diſtinguiſh it from that; though a reſemblance in habit and external appearance has cauſed the two ſpecies to be confounded together. This, however, could not have happened, had a ſtrict regard been had to the fructification in both.

In the Polypodium thelypteris, the ſeed-veſſels are arranged in cloſe regular lines, along the margin of the lobes; at firſt of a pale colour, changing brown in the progreſs; and, after the diſcharge of the ſeeds, ſpread out in breadth ſo as to occupy the whole diſk, except the middle only; this, however, is not always the caſe, for in ſome ſpecimens the lines remain diſtinct and ſeparate to the laſt; and in thoſe moſt effectually covered, the diſpoſition and arrangement of the ſeed-veſſels, in marginal lines, remain viſible.

But in the ſpecimen of Acroſtichum thelypteris now before me, which is in a middle ſtate of growth, and is accurately figured, *Tab.* 43, *Fig.* a, ſome of the ſeed-veſſels are viſible, as is expreſſed at *Fig.* c; they are ſmall, white, and placed irregularly on each ſide of the nerve; ſome are further advanced in growth than others; and the whole diſk, when a little magnified, appears beſet with ſmall tubercles, under which other ſeed-veſſels, yet in embrio, are lodged.

In the full grown plant, of which two ſecond leaves are figured, *Tab.* 44, on *Plate* 45, the whole under ſide, except the margin only, is cloſely covered with ſmall ſeed-veſſels, and they originate in every part of the diſk, as in the genus Acroſtichum, not in regular lines or rows, as in Polypodium. *Fig.* a. in *Tab.* 44, is a ſingle lobe magnified.

The barren leaves, *Fig.* b, were in a ſtate of half growth in the ſpecimens I examined; after the decay and fall of the ſecond leaves, the rib of the firſt leaf turns brown, and abides on the root over winter.

POLYPODIUM. Part I. Page 32.

POLYPODIUM rhœticum.

Sp. Pl. 1552. *Ray Syn.* 124. *Pluk. Phyt. Tab.* 89. *Fig.* 4.

TAB. XLV.

RHETIAN POLYPODY.

THE root of this plant, I have not had an opportuny of obſerving.

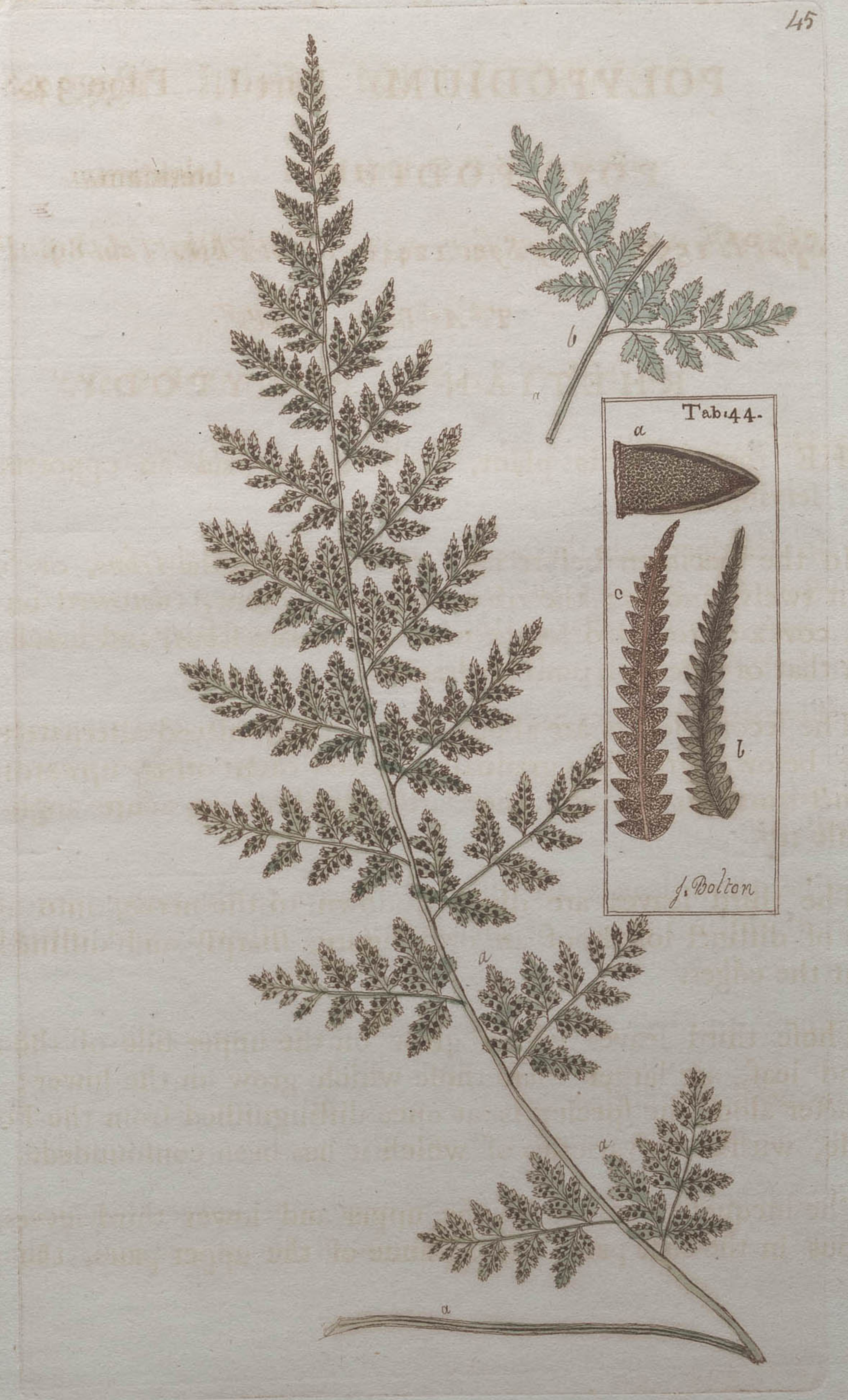
In the ſpecimen before me, the height of the *frons*, or firſt leaf, is about twelve inches; the rib is of a pale colour, furrowed on the upper ſide, covex or rounded on the under; is more ſtout, and much leſs brittle than that of the Polypodium fragile.

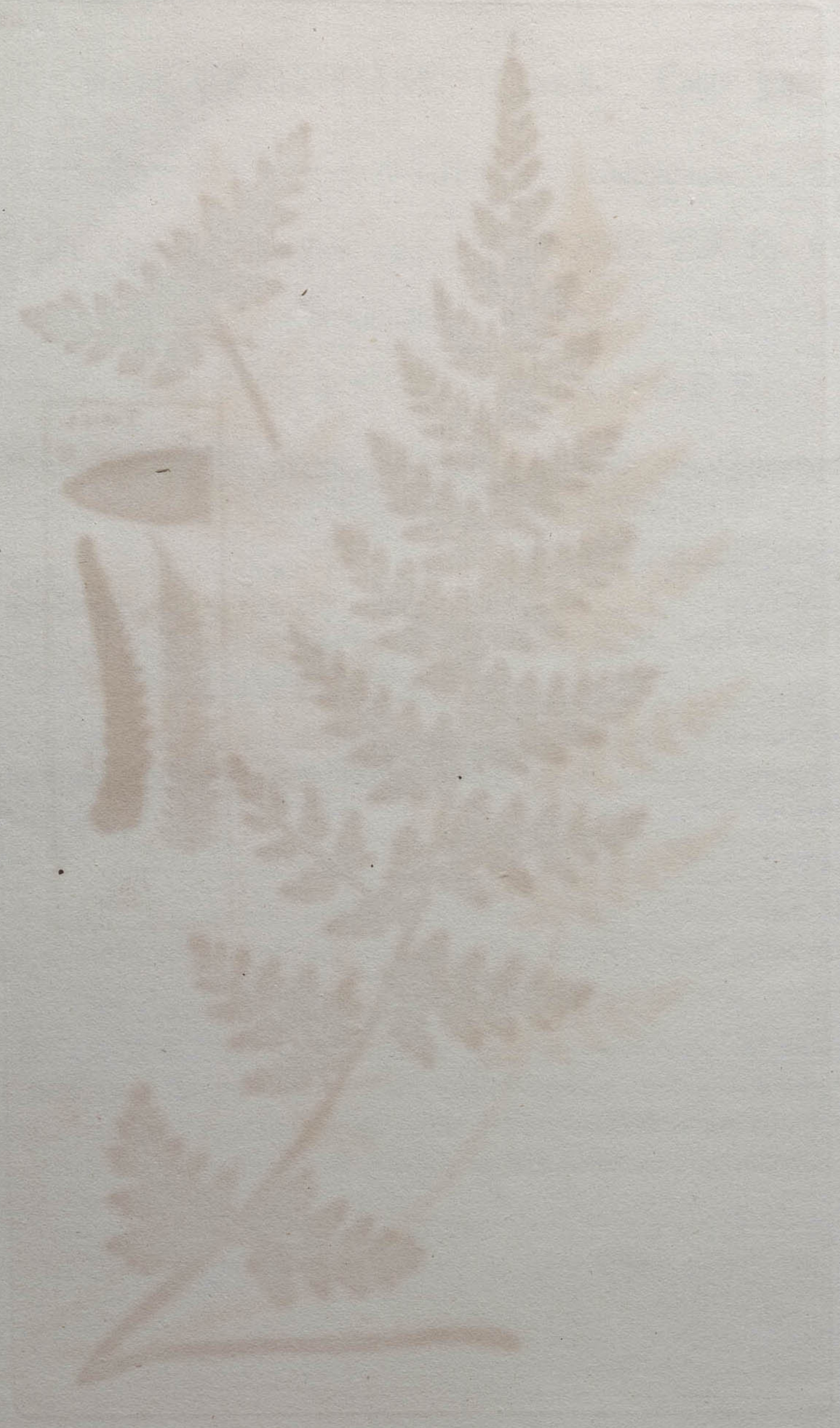
The ſecond leaves are about twelve pairs, placed alternately, very remote below, growing gradually nearer each other upwards, but are diſtinct quite to the top; they are placed at an acute angle with the middle rib.

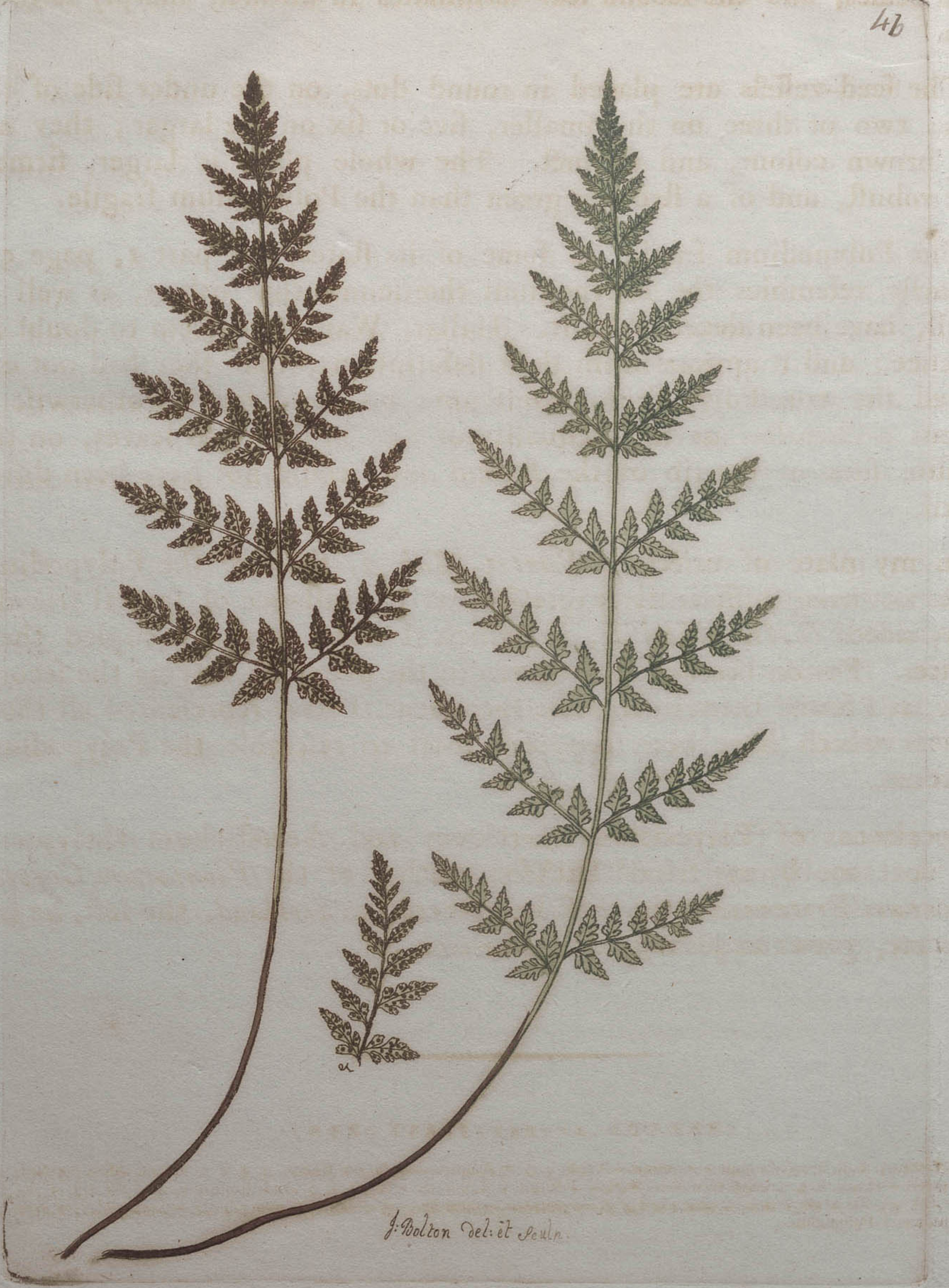
The third leaves are divided, down to the nerve, into about three pairs of diſtinct lobes, of an oval figure, ſharply and diſtinctly ſerrated about the edges.

Thoſe third leaves which grow on the upper ſide of the rib of the ſecond leaf, are larger than thoſe which grow on the lower; by which character alone the ſpecies is at once diſtinguiſhed from the Polypodium fragile, with ſome varieties of which it has been confounded.

The inequality of ſize in the upper and lower third leaves, is moſt obvious in the firſt pair; for in ſome of the upper pairs, the triple diviſion



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a
J. Bolton del. et sculp.

viſion ceaſes, and the ſecond leaf terminates in diſtinct, ſharply ſerrated lobes.

The ſeed-veſſels are placed in round dots, on the under ſide of the lobes; two or three on the ſmaller, five or ſix on the larger; they are of a brown colour, and diſtinct. The whole plant is larger, firmer, more robuſt, and of a ſtronger green than the Polypodium fragile.

The Polypodium fragile in ſome of its ſtates, ſee part 1, page 51, ſo nearly reſembles the Polypodium rhœticum, that others, as well as myſelf, have been deceived by it. Hallar, Wais, &c. ſeem to doubt its exiſtence; and it appears from their deſcriptions, that they had not examined the true Polypodium rhœticum; no more had I, otherwiſe ſo obvious a character as the inequality of ſize in the third leaves, on the oppoſite ſides of the rib of the ſecond leaf, could not have been diſregarded.

In my plate of varieties, *Part* 1, *Tab.* 2, thoſe of the Polypodium fragile not being ſufficiently expreſſed, at the inſtance of ſeveral friends, I have added *TAB. XLVI*; in which I have carefully copied theſe varieties. For on the two ſtems given in the plate, by varying the ſecond leaves, as I found them in ſeparate ſpecimens, I have repreſented all thoſe varieties which have been ſuppoſed moſt to reſemble the Polypodium rhœticum.

Specimens of Polypodium rhœticum and Acroſtichum thelypteris were ſent me by my friend Dickſon, author of the *Plantarum Cryptogamicarum Britanniæ*; the firſt he gathered in *Scotland*, the laſt, he informs me, grows in plenty about *Norwich*.

ERRATA IN THE FIRST PART.

INTRODUCTION, p. 6, l. 17, *for* ſupine *r.* prone.—P. 16, l. 3. *r.* Anglica.——*In the* BOOK, p. 5, l. 3. *r.* and when the ſeeds are diſcharged.—P. 40, l. 2, 3, *eraſe* Ger. Em. & Park.—P. 41, l. 1, tab. 22.—P. 41, l. 3, *eraſe* from this, *and the reſt of the ſentence.*—P. 51, l. 15, *eraſe* this is, *and the reſt of the ſentence*;—*ſame line, after* delicate, *add* tab. 46.—*Throughout the Book, for* Polipodium *r.* Polypodium.

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